

WILCOCKES'S AND FRYER'S
NEW AND MUCH ADMIR'D SYSTEM
ARITHMETIC
MENTAL CALCULATIONS.

REPRINTED FOR THE USE OF THE CENTRAL ACADEMY,
CHARLOTTETOWN, FROM THE FOURTH ENGLISH
EDITION, AND ENLARGED BY SEVERAL VALU-
ABLE ADDITIONS FROM
RICHSON'S MENTAL ARITHMETIC.

EDITED BY REV. JAMES WADDELL.

MASTER OF THE CENTRAL ACADEMY.

This novel and useful Treatise contains a great variety of excellent and illustrative rules, by which the student is enabled to make all the calculations necessary for every kind of business, frequently in less than one tenth the time and figures usually employed. It is peculiarly adapted to Bankers, Merchants, Tradesmen, &c. and is of the greatest importance to all classes, being the most simple and easy System of Arithmetic, that could be devised for the use of all scholastic establishments. The publishers have submitted it to the examination of such gentlemen as they considered most competent to judge of its real value, and they have made trial of it by giving private lectures to upwards of two thousand pupils, and from all they have received testimonials expressive of unqualified approbation.

PRINCE EDWARD ISLAND:
PRINTED AND PUBLISHED BY JAMES DOUGLAS HARRARD.

1837.

*To His Excellency Major-General Sir JOHN HARVEY,
K. C. H. & C. B. Lieutenant Governor and Comman-
der in Chief, in and over His Majesty's Island Prince
Edward, and its Dependencies, Chancellor, Vice
Admiral and Ordinary of the same, &c. &c. &c.*

SIR,

The deep interest which you have manifested in the cause of education, since your accession to the government of this Colony—the judicious suggestions which you have made, for the improvement of the District Schools—the zeal with which you have cherished the infancy of the Central Academy—the promptitude with which you have exerted your influence, to extend its operations—and the kind condescension which you have displayed, in countenancing my feeble efforts for its advancement—all, incite me to submit for your approval the accompanying Manual of Arithmetic, and to solicit your patronage, for a reprint, with additions, now in course of publication, for the use of this Institution.

I have the honor to be, Sir,

Your most obedient and

Most humble servant,

JAMES WALDELL.

Central Academy;

March 8th, 1837.

Government House,

March 15th, 1837.

REVEREND SIR,

I have looked through the "Manual" you sent me, illustrative of the process of "Mental Arithmetic"—as more immediately applicable to Mercantile calculations—with much interest. I certainly never before met with any publication, so well deserving the appellation of "Ready Reckoner," as this work. Its few and simple rules might well be denominated *golden*, as their perfect and easy acquisition cannot fail to confer upon the acquirer, as much facility and accuracy of calculation—so necessary for the successful management of business—as a whole life spent without the aid of such *lights*, as this little volume appears to me calculated to afford.

You have my free permission to use my name, in support of your '*reprint*' or *compilation*, in any way which you may think proper—and, I avail myself of this occasion, to congratulate the Central Academy, upon the acquisition of a class book, put forth in so complete a shape, and upon such moderate terms—the merit of which, I am persuaded, only requires to be extensively known, to cause its general adoption throughout, not only this, but the surrounding Colonies.

I remain, dear Sir,

Your very faithful servant,

J. HARVEY.

The Rev. James Waddell,
Central Academy.

CENTRAL ACADEMY,
Charlottetown, Jan. 6th, 1837.

The Trustees and Governors of the Central Academy having already witnessed with much pleasure the working of the system of Mental Arithmetic recently introduced into this Institution, and having approved of "Colburn's First Lessons," as a valuable class-book, rejoice in the opportunity afforded them of adopting Willcolkes's and Fryer's admirable and practical system of Arithmetic, as a sequel to that initiatory work. It is therefore—

ORDERED, That it be entered as a standing class-book in the Central Academy—that every facility be afforded to the publication of a reprint for that purpose—and that it be recommended for general adoption in all the District Schools.

By order of the Trustees,
JOHN LAWSON,
Vice President and Secretary.

The attention of the Board of Education having been this day called to a new and improved system of practical Arithmetic, about to issue from Mr. Hazzard's press, for the use of the Central Academy—they most heartily concur in recommending it to the immediate use of the various District Schools throughout the country, and to the patronage of the public at large.

By Order of the Board,
ALEX. BROWN, Secretary.
Charlottetown, 7th March, 1837.

PREFACE.



To say that the genius of innovation has of late years encroached upon the most popular systems of education, and introduced, in many instances, entirely new arrangements into the best regulated Seminaries—or, to state that new literary institutions have sprung into existence, threatening to eclipse the old, if not to cast them entirely into the shade—would be, to furnish no information to those who have given to the subject the most cursory attention; and to excite little interest in ordinary minds. But, to tell that the march of improvement has extended to ourselves—to announce, from our own press, the publication of a class-book, for the special benefit of so infantile and humble a Seminary as the “Central Academy,” Charlottetown—above all, to pretend to something *novel*, in the mode of treating a subject so frequently and so thoroughly illustrated, and so perfectly understood, as the first principles of Arithmetic have been long supposed to be—will, it is presumed, arrest attention, if it do not excite surprise. That an institution of so unpretending a character, should, in this respect, so early, take the precedence of all other Seminaries in these Colonies, will be remarked as somewhat singular, and the inquiry will naturally be suggested: How has it occurred? In reply, it is not necessary to furnish a history of the origin and progress of the Academy itself—nor to recount the biography of the authors of that system of Arithmetic which it has adopted. Of the former, it is sufficient to remark, that its charter is liberal, and its terms moderate, that its curriculum of elementary

instruction, is designed to be conducted, as far as practicable, upon the most modern and improved plans; and of the latter, that in their native country, they have reaped the reward of their labours, both in the way of emolument and fame.

The study of Intellectual Arithmetic had attracted the Editor's attention, previous to his appointment to this institution. He had introduced it, several months before, into the grammar school under his charge, in his native village—Truro, Nova Scotia—where he had tested its utility and proved its advantages over the ordinary routine of common arithmetical calculations, and whence he had been instrumental in extending it to other similar establishments. After entering upon his present charge, no time was lost in bringing it under the notice of the Trustees and Governors of the Central Academy. The first specimens of its practical operation, produced an effect which corresponded with the enlightened views and public spirit of that body, and a desire was expressed that it should be extensively cultivated. “Colburn's first lessons in Intellectual Arithmetic”—an admirable initiatory work, which should always precede and prepare for the successful use of the present volume, was immediately confirmed, as an academical class-book; and it became a desideratum to have it succeeded by some approved British publication, in which the tables of money, weights and measures, might correspond with our own; and in which clear and concise rules for the solution of practical questions, adapted to our own modes of business, might be expected to occur.

That desideratum was subsequently supplied by the kind agency of a literary friend, who had brought with him recently from England, a copy of “Willcolkes's and Fryer's” admirable work; and for it, the Editor

takes this opportunity to tender to him his cordial thanks.

The high price of that production, rendered an extensive importation of it almost impracticable, while its intrinsic excellence made it exceedingly desirable that its general use in the Academy should, if possible, be secured. Under these circumstances, depending, in some measure, upon the merit of the work itself—confiding in the influential patronage of our worthy Governor, His Excellency Sir John Harvey, who had declared himself a warm friend to general education—and having the encouragement of all officially employed in directing the management of elementary instruction in the Island, Mr. Haszard was induced, with a degree of enterprise, which reflects upon him the highest credit, to undertake, under the supervision of the Academy, to furnish a reprint, not only for the use of that institution, but for more general circulation.

To render the work still more complete, several valuable rules and examples *upon the descending scale*, have been added from “Richson’s Mental Arithmetic”—a more elaborate, but very useful work—and thus is obtained, at a price far below the cost of either of the originals, perhaps the most full, yet concise system of *practical* Arithmetic, which has yet appeared.

Were it necessary to advance more in favour of its merits, than the appended documents contain, many pages of laudatory testimonials might be supplied from the English copy. A slight examination, however, will suffice to secure for it the approbation of practical arithmeticians, and not only will Schools and public Seminaries profit by its adoption, but every man of business will find it advantageous to introduce it to his office.

The rules and illustrations are so plain as to be easily comprehended,* and the modes of operation are admirably calculated to engage the attention—stimulate the activity—and develop the resources of the juvenile mind.

The design and plan of the original work are thus stated by the publishers themselves:—

“ Part of the design of the following work is to supply what is principally wanted—an Arithmetic for Tradesmen. It appears evident that youths who are completed in Arithmetic in the ordinary way, stand in need of a much shorter method to enable them to enter a bank, or a counting-house, or to fill a situation behind a counter, and oftentimes it happens that persons who are engaged in traffic, experience the want of previous instruction, and find themselves obliged on occasion to have recourse to others, or to the tedious and uncertain operations of the school-boy’s method. An acquaintance with this simple and admirable plan (which can be obtained in a very short time) would entirely remove the difficulties under which such persons labour.”

“ The Plan undertaken is to comprehend in this one volume, the several Branches of Commercial Arithmetic, and to show the most compendious and ready methods of performing the calculation proper to each respectively.”

*Perhaps the exposition of the rule for the calculation of Interest at Six per cent. page 47, might be rendered more intelligible. The interest of a pound for a month having been shown to be a penny and a fifth, the pounds of the principle multiplied by the number of months, during which it has been at interest, will yield a product corresponding to so many pence and so many fifths of a penny. Then, as one penny and a fifth are one-tenth of a shilling, to divide by ten (cut off the unit figure) will obtain a quotient corresponding to shillings, and a remainder (if any) equal to so many tenths of a shilling, or, so many times a penny and a fifth.—ED.

“ The Publishers flatter themselves, the Rules given, with the Examples for calculating *cwts. qrs. and lbs.* at the various prices annexed to them per *lb.* will give the same degree of satisfaction that it has in no case failed to do, to the vast numbers who have made a trial of it. They also trust that the peculiarly short and simple method for ascertaining the average price and total amount of various goods, purchased at different prices, will be found extremely useful. By that method both are discovered with ease and simplicity; while in the ordinary way of working, such calculations are well known to occupy great length of time and a great number of figures—Interest is the next thing that presents itself to our notice; and the great satisfaction the Rules respecting it have given, and the value in which they are held by those who have tried the System, will be best found by referring to the numerous testimonials, in which the brevity and accuracy of the method contained in those Rules are especially commended.”

“ This work differs in the following respect from most treatises on Arithmetic—they are generally printed in two books, the one containing the Questions, the other the Solutions or Key to them. We however have introduced into this one book the Questions and also Solutions and Explanations so clear and explicit that no one can have any difficulty in thoroughly comprehending them. It is hoped therefore that the price charged will be considered reasonable.”

Central Academy, 18th March, 1837.

ARITHMETICAL TABLES.

NUMERATION.		PENNY.		SHILLINGS.	
Units	1	<i>d.</i>	<i>s. d.</i>	<i>s.</i>	<i>£. s.</i>
Tens	1 2	20 are	1 8	20 are	1 0
Hundreds	1 2 3	24 ‘	2 0	30 ‘	1 10
Thousands	1, 2 3 4	30 ‘	2 6	40 ‘	2 0
Tens of Thousands . . .	1 2, 3 4 5	36 ‘	3 0	50 ‘	2 10
C. of Thousands	1 2 3, 4 5 6	40 ‘	3 4	60 ‘	3 0
Millions	1 ; 2 3 4, 5 6 7	48 ‘	4 0	70 ‘	3 10
X. of Millions	1 2 ; 3 4 5, 6 7 8	50 ‘	4 2	80 ‘	4 0
C. of Millions	1 2 3 ; 4 5 6, 7 8 9	60 ‘	5 0	90 ‘	4 10
		70 ‘	5 10	100 ‘	5 0
		72 ‘	6 0	110 ‘	5 10
		80 ‘	6 8	120 ‘	6 0
		84 ‘	7 0	130 ‘	6 10
		90 ‘	7 6	140 ‘	7 0
		96 ‘	8 0	150 ‘	7 10
		100 ‘	8 4	160 ‘	8 0
		108 ‘	9 0	170 ‘	8 10
		120 ‘	10 0	180 ‘	9 0

CURRENT MONEY.

4 Farthings make . . .	1 Penny
12 Pence	1 Shilling
20 Shilling, 1 Pound, or Sovereign.	

Tables of Weights and Measures.

PRACTICE.	OF A HUNDRED.		WINE.	
OF A POUND, OR SOVEREIGN.	<i>gr. lb.</i>	<i>Cwt.</i>		
<i>s. d. £.</i>	2 0 are	1 half	2 pints make	1 quart
10 0 are	1 half		4 quarts ...	1 gallon
6 8 ‘	1 third	1 0 is	10 gallons ...	1 anker
5 0 ‘	1 fourth	0 16 are	42 gallous ...	1 tierce
4 0 ‘	1 fifth	0 14 ‘	63 gallons ...	1 hhd.
3 4 ‘	1 sixth		2 hhd. ...	1 pipe
2 6 ‘	1 eighth	TROY.	2 pipes ...	1 tun
2 0 ‘	1 tenth	24 gr. make	LONG MEASURE.	
1 8 ‘	1 twelfth	20 dwt. ...	3 barley-corns	1 inch
1 4 ‘	1 fifteenth	12 oz. ...	12 inches	1 foot
1 3 ‘	1 sixteenth		3 feet	1 yard
1 0 ‘	1 twentieth	AVOIRDUPOIS.	6 feet	1 fathm.
		16 dr. make	5½ yards	1 pole
		16 oz. ‘	40 poles	1 fur.
		14 lb. ‘	8 furlongs ...	1 mile
		28 lb. ‘	3 miles	1 league
		4 qr. ‘	69½ miles	1 degree
		20 cwt. ‘	1 ton.	
OF A SHILLING.			LAND MEASURE.	
<i>d. s.</i>			9 feet make	1 yard
6 are	1 half		30½ yards ...	1 pole
4 ‘	1 third		40 poles ...	1 rood
3 ‘	1 fourth		4 roods ...	1 acre
2 ‘	1 sixth			
1½ is	1 eighth			
1 ‘	1 twelfth			
		APOTHECARIES’.	CLOTH MEASURE.	
		20 gr. make	2½ inch. make	1 nail
		3 scr.	4 nails	1 quar.
		8 dr.	3 qrs.	1 Fl.ell.
		12 oz.	4 qrs.	1 yard
			5 qrs.	1 En.ell.
		ALE AND BEER.	TIME.	
		2 pints make	60 sec. ...	1 minute
		4 quarts ...	60 min. ...	1 hour
		9 gallons ...	24 hours ...	1 day
		2 firkins ...	7 days ...	1 week
		2 kilderkins	4 weeks ...	1 month
		1½ barrels ...		
		2 barrels ...		
		3 barrels ...		
		SOLID MEASURE.		
		1728 inches		
		1 solid foot		
		27 feet ...		
		1 yard		

ENLARGED MULTIPLICATION TABLE.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240

UNPRECEDENTED SYSTEM
OF
ARITHMETIC
AND
MENTAL CALCULATIONS.



FIRST GENERAL RULE.

To know the Amount of any Number of *yards, lbs. gallons, stones, ells*, or any other article, requiring to be made up at any given pence, from $\frac{1}{4}d.$ to $11\frac{3}{4}d.$ both inclusive.

Find the amount of the Number of *yards, lbs. gallons, &c. &c.* at one penny, and multiply it by the price, when a farthing shall occur with any number of given pence (as $3\frac{1}{4}d.$ $4\frac{1}{2}d.$ or $9\frac{3}{4}d.$ &c.) add one quarter, or $\frac{1}{4}$, of what it amounts to at one penny. When a half-penny shall occur with any given pence, add half the amount of what it comes to at one penny, and when 3 farthings shall occur, add three quarters of what it amounts to at one penny, which may be done in one or two lines, as the Student shall think fit.

The cause of this Rule is so clearly demonstrated, that giving any further explanation than the Rule and Examples themselves contain would be superfluous; the desire of the Publishers being to make the System throughout, perfectly intelligible to persons of ordinary capacity, they trust will be sufficient apology for introducing at the beginning of each Rule, particularly the first, examples so very simple: they may rest assured that every thing that can be useful shall present itself as they proceed. *All have not the same powers of comprehension.*

A variety of examples solved by both methods are here laid down in the following

EXAMPLES.

What will 36 *lbs.* cost at $11d.$ per *lb* ?

36 at 1 penny equal to 3*s.*
multiplied by 11

£ 1.. 13 *Ans.*

What will 96 yards of any article come to at 7*d.* per yard ?

96 at one penny = 8*s.*
multiplied by 7

£2.. 16 *Ans.*

What will 24 stones come to at 10*d.* per stone?

24 at one penny = 2*s.*
10

£ 1 *Ans.*

What will 108 gallons come to at 5*d.* per gallon?

9*s.* at 1 penny.
5

£2.. 5 *Ans.*

What will 48 *lbs.* come to at 9*d.* per *lb*?

4*s.* at 1 penny.
9

£1..16 *Ans.*

What will 120 ells come to at 10*d.* per ell ?

10*s.* at 1 penny.
10

£5 *Ans.*

What will 60 yards come to at 8*d.* per yard ?

5*s.* at 1 penny.
8

£2

What will 132 gallons come to at 11*d.* per gallon ?

11*s.* at 1 penny.
11

£6.. 1 *Ans.*

What will 72 *lbs.* come to at 7*d.* per *lb* ?

6*s.* at 1 penny.
7

£2..2 *Ans.*

What will 144 quarts come to at 5*d.* per quart?
12*s.* at 1 penny.

5

—
£3 *Ans.*

What will 29 ounces come to at 9*d.* per ounce?
2*s.* 5*d.* at 1 penny.

9

—
£1.. 1.. 9 *Ans.*

What will 55 come to at 7*d.* each?
4*s.* 7*d.* at 1 penny.

7

—
£1.. 12.. 1 *Ans.*

What will 68 come to at 10*d.* each?
5*s.* 8*d.* at 1 penny.

10

—
£2.. 16.. 8 *Ans.*

What will 87 pints come to at 11*d.* per pint?
7*s.* 3*d.* at 1 penny.

11

—
£3.. 19.. 9 *Ans.*

What will 99 stones come to at 8*d.* per stone?
8*s.* 3*d.* at 1 penny.

8

—
£3.. 6.. 0 *Ans.*

What will 1 *cwt.* = 112 *lbs.* come to at 9*d.* per *lb.*?
9*s.* 4*d.* at 1 penny.

9

—
£4.. 4.. 0 *Ans.*

What will 119 *lbs.* come to at 7*d.* per *lb.*?
9*s.* 11*d.* at 1 penny.

7

—
£3.. 9.. 5 *Ans.*

What will 133 *lbs.* come to at 11*d.* per *lb.*?

11*s.* 1*d.* at 1 penny.

11

£6 . 1 . 11 *Ans.*

What will a pipe = 126 gal. come to at 9*d.* per gallon?

10*s.* 6*d.* at 1 penny.

9

£4 . 14 . 6 *Ans.*

What will 154 yards come to at 5*d.* per yard?

12*s.* 10*d.* at 1 penny.

5

£3 . 4 . 2 *Ans.*

What will 171 yards come to at 8*d.* per yard?

14*s.* 3*d.* at 1 penny.

8

£5 . 14 . 0 *Ans.*

What will 189 *lbs.* come to at 11*d.* per *lb.*?

15*s.* 9*d.* at 1 penny.

11

£8 . 13 . 3 *Ans.*

What will 199 come to at 7*d.* each?

16*s.* 7*d.* at 1 penny.

7

£5 . 16 . 1 *Ans.*

What will a tun = 252 gal. come to at 10*d.* per gallon?

£1 . 1 . 0 at 1 penny.

10

£10 . 10 . 0 *Ans.*

What will 40 weeks come to at 7*d.* per day?

280 = £1 . 3 . 4 at 1 penny.

7

£8 . 3 . 4 *Ans.*

What will 50 weeks = 350 days come to at 10*d.* per day?

$$\begin{array}{r} \text{£}1 \cdot 9 \cdot 2 \text{ at 1 penny.} \\ 10 \\ \hline \end{array}$$

$\text{£}14 \cdot 11 \cdot 8$ *Ans.*

What will a leap year of 366 days come to at 11*d.* per day?

$$\begin{array}{r} \text{£}1 \cdot 10 \cdot 6 \text{ at 1 penny.} \\ 11 \\ \hline \end{array}$$

$\text{£}16 \cdot 15 \cdot 6$ *Ans.*

What will 560 *lbs.* of sugar cost at 7*d.* per *lb.*

$$\begin{array}{r} \text{£}2 \cdot 6 \cdot 8 \text{ at 1 penny.} \\ 7 \\ \hline \end{array}$$

$\text{£}16 \cdot 6 \cdot 8$ *Ans.*

What will 980 yards of calico cost at 10*d.* per yard?

$$\begin{array}{r} \text{£}4 \cdot 1 \cdot 8 \text{ at 1 penny.} \\ 10 \\ \hline \end{array}$$

$\text{£}40 \cdot 16 \cdot 8$ *Ans.*

What will 999 gallons come to at 9*d.* per gallon?

$$\begin{array}{r} \text{£}4 \cdot 3 \cdot 3 \text{ at 1 penny.} \\ 9 \\ \hline \end{array}$$

$\text{£}37 \cdot 9 \cdot 3$ *Ans.*

When quarters, halves, or three quarters, shall occur in the quantity, make them up with the yards, at the rate of 1 penny per yard, viz. for a quarter of a yard reckon $\frac{1}{4}$ *d.*, for half yard, add $\frac{1}{2}$ *d.* &c. see

EXAMPLES.

WHAT will $42\frac{1}{2}$ yards cost at 4*d.* per yard?

$$\begin{array}{r} 3\text{s. } 6\frac{1}{2}\text{i. at 1 penny.} \\ 4 \\ \hline \end{array}$$

$\text{s } 14 \cdot 2$ *Ans.*

What will $65\frac{1}{4}$ come to at 8*d.* each?

$$\begin{array}{r} 5\text{s. } 5\frac{1}{4}\text{i. at 1 penny.} \\ 8 \\ \hline \end{array}$$

$\text{£}2 \cdot 3 \cdot 6$ *Ans.*

What will $87\frac{3}{4}$ ounces come to at $3d.$ per ounce?

$7s. 3\frac{3}{4}d.$ at 1 penny.
3

—————
£1 . 1 . $11\frac{1}{4}$ Ans.

What will $99\frac{3}{4}$ come to at $8d.$ each?

$8s. 3\frac{3}{4}d.$ at 1 penny.
8

—————
£3 . 6 . 6 Ans.

What will $112\frac{1}{2}$ come to at $10d.$ each?

$9s. 4\frac{1}{2}d.$ at 1 penny.
10

—————
£4 . 13 . 9 Ans.

What will $126\frac{1}{4}$ ounces come to at $7d.$ per ounce?

$10s. 6\frac{1}{4}d.$ at 1 penny.
7

—————
£3 . 13 . $7\frac{3}{4}$ Ans.

What will $140\frac{3}{4}$ yards come to at $10d.$ per yard?

$11s. 8\frac{3}{4}d.$ at 1 penny.
10

—————
£5 . 17 . $3\frac{1}{2}$ Ans.

What will 48 lbs. come to at $7\frac{1}{4}d.$ per lb?

48 at 1 penny = 4s.

$7\frac{1}{4}$

—————
£1 . 9 . 0 Ans.

Here we multiply the 4s. (what it comes to at $1d.$) by 7, and add in the quarter of 4s. what it comes to at $\frac{1}{4}d.$

What will 60 lbs. come to at $5\frac{1}{2}d.$ per lb?

60 at 1 penny = 5s.

$5\frac{1}{2}$

—————
£1 . 7 . 6 Ans.

What will 72 lbs. come to at $9\frac{3}{4}d.$ per lb?

72 at $1d.$ = 6s.

$9\frac{3}{4}$

—————
£2 . 18 . 6 Ans.

Here the 6s. what it comes to at 1 penny, is multiplied by 9, and the 3 quarters at 6s. added in, what it comes to at $\frac{3}{4}d.$ equal to 4s. 6d.

What will 84 gallons come to at $11\frac{1}{2}d.$ per gallon?

84 at 1 penny = 7s.

$$\begin{array}{r} 11\frac{1}{2} \\ \hline \text{£}1 \cdot 0 \cdot 6 \text{ Ans.} \end{array}$$

What will 96 lbs. come to at $10\frac{3}{4}d.$ per lb?

96 at 1 penny = 8s.

$$\begin{array}{r} 10\frac{3}{4} \\ \hline \text{£}4 \cdot 6 \text{ Ans.} \end{array}$$

What will 108 lbs. come to at $2\frac{3}{4}d.$ per lb?

108 at 1 penny = 9s.

$2\frac{3}{4}$

The 3 quarters of 9s. being 6s. 9d. is added in.

$$\begin{array}{r} \hline \text{£}1 \cdot 4 \cdot 9 \text{ Ans.} \end{array}$$

What will 52 yards come to at $6\frac{1}{2}d.$ per yard?

4s. 4d.

$6\frac{1}{2}$

Here in multiplying 4s. 4d. (what it comes to at 1d.) 2s. 2d. what it comes to at $\frac{1}{2}d.$ is brought in.

$$\begin{array}{r} \hline \text{£}1 \cdot 8 \cdot 2 \text{ Ans.} \end{array}$$

Or thus, in two lines, 52 at 1d. = 4s. 4d.

$6\frac{1}{2}$

1 · 6 · 0 at 6d.

2 · 2 at $\frac{1}{2}d.$

$$\begin{array}{r} \hline \text{£}1 \cdot 8 \cdot 2 \text{ Ans.} \end{array}$$

The young pupil may find the way of doing it in two lines, the easiest to be understood.

What will 144 stones cost at $7\frac{3}{4}d.$ per stone?

144 at 1 penny = 12s.

$7\frac{3}{4}$

$$\begin{array}{r} \hline \text{£}4 \cdot 13 \cdot 0 \text{ Ans.} \end{array}$$

What will 56 lbs. come to at $7\frac{1}{4}d.$ per lb?

56 at 1 penny = 4s. 8d.

$7\frac{1}{4}$

1s. 2d. at $\frac{1}{4}d.$ to bring in.

$$\begin{array}{r} \hline \text{£}1 \cdot 13 \cdot 10 \text{ Ans.} \end{array}$$

What will 64 lbs. come to at $8\frac{2}{3}d.$ per lb?

64 at 1 penny = 5s. 4d.

$8\frac{2}{3}$

4s. to bring in

$$\begin{array}{r} \hline \text{£}2 \cdot 6 \cdot 8 \text{ Ans.} \end{array}$$

What will 78 yards come to at $10\frac{1}{4}$ per yard?

78 at 1 penny = 6s. 6d.

$$\begin{array}{r} 10\frac{1}{4} \\ \hline \text{£}3 \cdot 6 \cdot 7\frac{1}{2} \text{ Ans.} \end{array} \quad 1s. 7\frac{1}{2}d. \text{ to bring in.}$$

What will 90 yards come to at $11\frac{3}{4}d.$ per yard?

90 at 1 penny = 7s. 6d.

$$\begin{array}{r} 11\frac{3}{4} \\ \hline \text{£}4 \cdot 8 \cdot 1\frac{1}{2} \text{ Ans.} \end{array} \quad 5s. 7\frac{1}{2}d. \text{ to bring in.}$$

What will 99 yards come to at $8\frac{1}{2}d.$ per yard?

99 at 1 penny = 8s. 3d.

$$\begin{array}{r} 8\frac{1}{2} \\ \hline \text{£}3 \cdot 10 \cdot 1\frac{1}{2} \text{ Ans.} \end{array} \quad 4s. 1\frac{1}{2}d. \text{ to bring in.}$$

What will $50\frac{1}{2}$ yards come to at $4\frac{1}{2}d.$ per yard?

$50\frac{1}{2}$ at 1 penny = 4s. $2\frac{1}{2}d.$

$$\begin{array}{r} 4\frac{1}{2} \\ \hline s. 18 \cdot 11\frac{1}{4} \text{ Ans.} \end{array} \quad 2s. 1\frac{1}{4}d. \text{ to bring in.}$$

Or thus, in two lines : $4s. 2\frac{1}{2}d.$ at $1d.$

$$\begin{array}{r} 4 \\ \hline 16 \cdot 10 \text{ at } 4d. \\ 2 \cdot 1\frac{1}{4}d \text{ at } \frac{1}{2}d. \\ \hline s. 18 \cdot 11\frac{1}{4} \text{ Ans.} \end{array}$$

What will $52\frac{3}{4}$ yards come to at $6\frac{1}{2}d.$ each?

$52\frac{3}{4}$ at 1 penny = 4s. $4\frac{3}{4}d.$

$$\begin{array}{r} 6\frac{1}{2} \\ \hline \text{£}1 \cdot 8 \cdot 6\frac{7}{8} \text{ Ans.} \end{array} \quad \begin{array}{l} 2s. 2\frac{3}{8}d. \text{ to bring in,} \\ \text{being the amount} \\ \text{at } \frac{1}{2}d. \end{array}$$

Or thus: $4s. 4\frac{3}{4}d.$ at $1d.$

$$\begin{array}{r} 6\frac{1}{2} \\ \hline 1 \cdot 6 \cdot 4\frac{1}{2} \text{ at } 6d. \\ 2 \cdot 2\frac{3}{8} \text{ at } \frac{1}{2}d. \\ \hline \text{£}1 \cdot 8 \cdot 6\frac{7}{8} \text{ Ans.} \end{array}$$

What will $64\frac{1}{4}$ yards come to at $10\frac{3}{4}$ per yard?

5s. $4\frac{1}{4}d.$

$$\begin{array}{r} 10\frac{3}{4} \\ \hline \text{£}2 \cdot 17 \cdot 6\frac{11}{16} \end{array} \quad 4s. 0\frac{1}{16}d. \text{ at } \frac{3}{4}d. \text{ to bring in}$$

What will $1960\frac{1}{2}$ yards come to at $11\frac{1}{4}d.$ per yard?

$$\begin{array}{r} \text{£}8 \cdot 3 \cdot 4\frac{1}{2} \\ \underline{\quad\quad\quad} \\ 11\frac{1}{4} \end{array} \quad \text{£}2 \cdot 0 \cdot 10\frac{1}{8} \text{ to bring in.}$$

$$\underline{\underline{\text{£}91 \cdot 17 \cdot 11\frac{3}{8} \text{ Ans.}}}}$$

What will 240 yards cost at $3\frac{1}{10}d.$ per yard?

$$\begin{array}{r} 240 \text{ at } 1d. \text{ per yard} = \text{£}1 \\ \underline{\quad\quad\quad} \\ 3\frac{1}{10} \end{array} \quad \text{£}3 \cdot 1 \cdot 3 \text{ Ans.}$$

Note, The quantity at $1d.$ per yard is found to be $\text{£}1$, which is multiplied by the pence of the price, and the $\frac{1}{10}$ of the price at $1d.$ being taken for the $\frac{1}{10}$.

What will 480 yards of cotton goods cost at $7\frac{3}{10}d.$ per yard?

$$\begin{array}{r} \text{£}2 \\ \underline{\quad\quad\quad} \\ 7\frac{3}{10} \end{array} \quad 7s. 6d. \text{ at } \frac{3}{10}d. \text{ to bring in.}$$

$$\underline{\underline{\text{£}14 \cdot 7 \cdot 6 \text{ Ans.}}}}$$

What will 963 yards cost at $8\frac{11}{10}d.$ per yard?

$$\begin{array}{r} 960 \text{ at } 1d. = \text{£}4 \\ \underline{\quad\quad\quad} \\ 8\frac{11}{10} \end{array} \quad \text{£}3 \cdot 5 \text{ to bring in.}$$

$$\begin{array}{r} \text{Price of } 960 \text{ yds.} = 35 \cdot 5 \\ 3 \text{ at } 8\frac{11}{10}d. = \quad 2 \cdot 2\frac{7}{10} \\ \underline{\quad\quad\quad} \\ \text{£}35 \cdot 7 \cdot 2\frac{7}{10} \text{ Ans.} \end{array}$$

SECOND GENERAL RULE.

A RULE to know the Amount of any Number of *yards, ells, stons, lbs. gallons, quarts, &c. &c.* at any given shillings per yard, &c. &c.

Find the amount at one shilling and multiply it by the price.

Should 3 pence occur in the price, add one quarter of what it amounts to at a shilling; if 4 pence, add one third; if 6 pence add half; if 9 pence, add three quarters at what it amounts to at a shilling.

Should the pence in the price not be an aliquot part of a shilling, find for the shillings by this Rule, and for the pence by the Rule for pence, which amounts add together.

EXAMPLES

to the foregoing Rules.

What will 31 yards come to at 3s. per yard?

$$\begin{array}{r}
 31 \text{ at 1 shilling} = \text{£}1 \cdot 11 \\
 \text{multiplied by} \quad \quad \quad 3 \\
 \hline
 \text{£}4 \cdot 13 \text{ Ans.}
 \end{array}$$

What will 47 yards come to at 7s. per yard?

$$\begin{array}{r}
 47 \text{ at 1 shilling} = \text{£}2 \cdot 7 \\
 \quad \quad \quad \quad \quad \quad 7 \\
 \hline
 \text{£}16 \cdot 9 \text{ Ans.}
 \end{array}$$

What will 55 yards cost at 9s. per yard?

$$\begin{array}{r}
 55 \text{ at 1 shilling} = \text{£}2 \cdot 15 \\
 \quad \quad \quad \quad \quad \quad 9 \\
 \hline
 \text{£}24 \cdot 15 \text{ Ans.}
 \end{array}$$

What will 71 gallons come to at 11s. per gallon?

$$\begin{array}{r}
 71 \text{ at 1 shilling} = \text{£}3 \cdot 11 \\
 \quad \quad \quad \quad \quad \quad 11 \\
 \hline
 \text{£}39 \cdot 1 \text{ Ans.}
 \end{array}$$

What will 89 yards come to at 12s. per yard?

$$\begin{array}{r}
 89 \text{ at 1s.} = \text{£}4 \cdot 9 \\
 \quad \quad \quad \quad \quad \quad 12 \\
 \hline
 \text{£}53 \cdot 8 \text{ Ans.}
 \end{array}$$

This and others of a similar nature can be done by another method, which shall be explained as we proceed.

What will 98 gallons come to at 11s. per gallon?

$$\begin{array}{r}
 \text{£}4 \cdot 18 \\
 \quad \quad \quad \quad \quad \quad 11 \\
 \hline
 \text{£}53 \cdot 18 \text{ Ans.}
 \end{array}$$

In introducing fractional parts of a *yard*, *lb.* &c. in the quantity, when the price is shillings per yard, reckon the quarter as 3 pence, the half as 6 pence, and the 3 quarters as 9 pence, as the following examples will explain.

What will $47\frac{1}{4}$ yards cost at 5s. per yard?

$$\begin{array}{r}
 47\frac{1}{4} \text{ at 1 shilling} = \text{£}2 \cdot 7 \cdot 3 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad 5 \\
 \hline
 \text{£}11 \cdot 16 \cdot 3 \text{ Ans.}
 \end{array}$$

What will $69\frac{1}{2}$ yards cost at 11s. per yard?

$$69\frac{1}{2} \text{ at 1 shilling} = \text{£}3 \cdot 9 \cdot 6$$

11

$$\text{£}38 \cdot 4 \cdot 6 \text{ Ans.}$$

What will $85\frac{3}{4}$ gallons cost at 9s. per gallon?

$$85\frac{3}{4} \text{ at 1 shilling} = \text{£}4 \cdot 5 \cdot 9$$

9

$$\text{£}38 \cdot 11 \cdot 9 \text{ Ans.}$$

What will $111\frac{1}{4}$ lbs. come to at 8s. per lb?

$$\text{at 1 shilling} = \text{£}5 \cdot 11 \cdot 3$$

8

$$\text{£}44 \cdot 10 \cdot 0 \text{ Ans.}$$

What will $129\frac{1}{2}$ oz. come to at 12s. per oz?

$$\text{at 1 shilling} = \text{£}6 \cdot 9 \cdot 6$$

12

$$\text{£}77 \cdot 14 \cdot 0 \text{ Ans.}$$

What will $185\frac{3}{4}$ st. come to at 7s. per st.?

$$\text{at 1 shilling} = \text{£}9 \cdot 5 \cdot 9$$

7

$$\text{£}65 \cdot 0 \cdot 3 \text{ Ans.}$$

What will $365\frac{1}{2}$ lbs. come to at 13s. per lb?

$$365\frac{1}{2} \text{ at 1 shilling} = \text{£}18 \cdot 5 \cdot 6$$

13

$$\text{£}237 \cdot 11 \cdot 6 \text{ Ans.}$$

What will $540\frac{3}{4}$ yards cost at 16s. per yard?

$$\text{at 1 shilling} = \text{£}27 \cdot 0 \cdot 9$$

16

$$\text{£}432 \cdot 12 \cdot 0 \text{ Ans.}$$

What will $661\frac{1}{8}$ yards come to at 6s. per yard?

$$\text{at 1 shilling} = \text{£}33 \cdot 1 \cdot 1\frac{1}{2}$$

6

$\frac{1}{8}$ of a yard at 1s.
per yard is $1\frac{1}{2}d.$

$$\text{£}198 \cdot 6 \cdot 9 \text{ Ans.}$$

What will $664\frac{5}{8}$ gallons come to at 7s. per gallon?
 at 1 shilling = $\pounds 33 \cdot 4 \cdot 7\frac{1}{2}$

$$\begin{array}{r} \hline \pounds 232 \cdot 12 \cdot 4\frac{1}{2} \text{ Ans.} \\ \hline \end{array}$$

What will $722\frac{7}{8}$ yards come to at 8s. per yard?
 at 1 shilling = $\pounds 36 \cdot 2 \cdot 10\frac{1}{2}$

$$\begin{array}{r} \hline \pounds 289 \cdot 3 \cdot 0 \text{ Ans.} \\ \hline \end{array}$$

What will 80 yards come to at 4s. 3d. per yard?
 80 at 1 shilling = $\pounds 4$

$$\begin{array}{r} 4\frac{1}{4} \\ \hline \pounds 17 \text{ Ans.} \\ \hline \end{array}$$

Here 3d. being the $\frac{1}{4}$ of a shilling, the quarter of $\pounds 4$, what it comes to at 3d. is added when multiplying by the price.

What will 100 gallons come to at 5s. 6d. per gallon?
 100 at 1 shilling = $\pounds 5$

$$\begin{array}{r} 5\frac{1}{2} \\ \hline \pounds 27 \cdot 10 \text{ Ans.} \\ \hline \end{array}$$

What will 120 lbs. come to at 6s. 6d. per lb?
 120 at 1 shilling = $\pounds 6$

$$\begin{array}{r} 6\frac{1}{2} \\ \hline \pounds 39 \text{ Ans.} \\ \hline \end{array}$$

What will 140 yards cost at 11s. 6d. per yard?
 at 1 shillings = $\pounds 7$

$$\begin{array}{r} 11\frac{1}{2} \\ \hline \pounds 80 \cdot 10 \text{ Ans.} \\ \hline \end{array}$$

What will 160 oz. come to at 5s. 3d. per oz.?
 at 1 shilling = $\pounds 8$

$$\begin{array}{r} 5\frac{1}{4} \\ \hline \pounds 42 \text{ Ans.} \\ \hline \end{array}$$

What will 180 lbs. cost at 12s. 9d. per lb?

at 1s. = $\pounds 9$
 $12\frac{3}{4}$

$$\begin{array}{r} \hline \pounds 114 \cdot 15 \text{ Ans.} \\ \hline \end{array}$$

Here 9d. being the 3 quarters of a shilling, $\pounds 6 \cdot 15s.$ is added in, being the 3 quarters of what it comes to at 1 shilling.

What will 44 yards cost at 4s. 1d. per yard ?

$$\begin{array}{r} 44 \text{ at } 1s. = \text{£}2 . 4 \\ \quad \quad \quad 4 . 1 \\ \hline \end{array}$$

£8 . 19 . 8 *Ans.*

Here 44 yards at 1d. being 3s. 8d. is brought in one line.

What will 66 lbs. come to at 5s. 1d. per lb ?

$$\begin{array}{r} \text{at } 1s. = \text{£}3 . 6 \\ \quad \quad \quad 5 . 1 \\ \hline \end{array}$$

£16 . 15 . 6 *Ans.*

5s. 6d. to bring in, being the amount at 1 penny.

What will 90 oz. come to at 6s. 2d. per oz ?

$$\begin{array}{r} \text{at } 1s. = \text{£}4 . 10 \\ \quad \quad \quad 6 . 2 \\ \hline \end{array}$$

£27 . 15 . 0 *Ans.*

90 at 2d. being 15s. to bring in.

What will 102 gallons come to at 7s. 2d. per gallon ?

$$\begin{array}{r} \text{at } 1 \text{ shilling} = \text{£}5 . 2 \\ \quad \quad \quad 7 . 2 \\ \hline \end{array}$$

£36 . 11 . 0 *Ans.*

102 at 2d. being 17s. to bring in.

What will $112\frac{1}{2}$ yards cost at 9s. 2d. per yard ?

$$\begin{array}{r} \text{at } 1s. = \text{£}5 . 12 . 6 \\ \quad \quad \quad 9 . 2 \\ \hline \end{array}$$

£51 . 11 . 3 *Ans.*

18s. 9d. to bring in.

What will $126\frac{1}{4}$ gallons cost at 12s. 1d. per gallon ?

$$\begin{array}{r} \text{at } 1 \text{ shilling} = \text{£}6 . 6 . 3 \\ \quad \quad \quad 12 . 1 \\ \hline \end{array}$$

£76 . 5 . $6\frac{1}{4}$ *Ans.*

10s. $6\frac{1}{4}$ d. to bring in

What will 48 yards cost at 5s. 5d. per yard ?

$$\begin{array}{r} \text{at } 1s. = \text{£}2 . 8 \\ \quad \quad \quad 5 \\ \hline \end{array}$$

£13 . 0 *Ans.*

$$\begin{array}{r} 4s. \text{ at } 1 \text{ penny.} \\ \quad \quad \quad 5 \\ \hline \end{array}$$

£1 at 5 pence.

Such as the above may be done by another method, which shall be explained as we proceed.

What will 72 yards cost at 7s. 7d. per yard ?

$$\begin{array}{r} \text{at } 1s. = \text{£}3 . 12 \\ \quad \quad \quad 7 \\ \hline \end{array}$$

£27 . 6 *Ans.*

$$\begin{array}{r} 6s. \text{ at } 1d. \\ \quad \quad \quad 7 \\ \hline \end{array}$$

£2 . 2 to bring in.

What will 84 gallons cost at 9s. 5d. per gallon?

at 1s. £4 . 4	7s. at 1d.
9	5

£39 . 11 *Ans.*

£1 . 15 to bring in.

What will 96 oz. cost at 7s. 10d. per oz?

at 1s. = £4 . 16	8s. at 1d.
7	10

£37 . 12 *Ans.*

£4 . 0 to bring in.

What will 108 lbs. cost at 9s. 5½d. per lb ?

at 1s. = £5 . 8	9s. at 1d.
9	5½

£51 . 1 . 6 *Ans.*

£2 . 9 . 6 to bring in.

What will 120 gallons come to at 11s. 7¾d. per gallon?

at 1s. = £6	10s. at 1d.
11	7¾

£69 . 17 . 6 *Ans.*

£3 . 17 . 6 to bring in.

What will 144 yards cost at 13s. 10¾d. per yard ?

at 1s. = £7 . 4	12s. at 1d.
13	10¾

£100 . 1 *Ans.*

£6 . 9 . 0 to bring in.

What will 150½ gallons come to at 5s. 5d. per gallon?

at 1s. = £7 . 10 . 6	12s. 6½d. at 1d.
5	5

Ans. £40 . 15 . 2½

£3 . 2 . 8½ to bring in.

What is the price of 140½ gallons at 17s. 1d. per gallon?

at 1s. = £7 . 0 . 6	11s. 8½d. to bring in.
17 1	

£120 . 0 . 2½ *Ans.*

What will 80 yards come to at 14s. per yard?

80 at 1s. = £4

£56 *Ans.*

In this and the following Sums a great many figures may be saved, by multiplying the Shillings of the price by the number of £. that the quantity amount to at 1s. which brings out the Answer in £.

What will 120 yards come to at 23s. per yard ?

$$120 \text{ at } 1s. = \underline{\underline{\pounds 6}}$$

$\pounds 138$ Ans.

What will 140 yards come to at 27s. per yard ?

$$140 \text{ at } 1s. = \underline{\underline{\pounds 7}}$$

$\pounds 189$ Ans.

What will 160 gallons come to at 33s. 6d. per gallon ?

$$160 \text{ at } 1s. = \underline{\underline{\pounds 8}}$$

$\pounds 268$ Ans.

In this Question 6d. has been introduced, for which £4 is added in, because 160 at 6d. amounts to £4.

What will 180 yards come to at 37s. 3d. per yard ?

$$37s. \quad 3d.$$

$$180 \text{ at } 1s. = \underline{\underline{\pounds 9}}$$

$\pounds 2 \cdot 5$ the $\frac{1}{4}$ of $\pounds 9$.
to bring in.

$\pounds 335 \cdot 5$ Ans.

What will 200 yards come to at 39s. 4d. per yard ?

$$39s. \quad 4d.$$

$$200 \text{ at } 1s. = \underline{\underline{\pounds 10}}$$

$\pounds 3 \cdot 6 \cdot 8$ the $\frac{1}{3}$ of
 $\pounds 10$ to bring in.

$\pounds 393 \cdot 6 \cdot 8$ Ans.

When the price is any even number of Shillings—

RULE.—Multiply the quantity by half the Shillings, double the out side or unit figure for Shillings, and let the other stand for £. which will give the answer required.

EXAMPLES.

WHAT would 123 yards cost at 12s. per yard :

$$123$$

6 equal to half of 12.

$\pounds 73$ 16 Ans.

3 *

The cause of this Rule is, that instead of multiplying by the number of Shillings, and dividing by 20 (which is the usual way) you multiply by half the number of shillings and divide by 10, which is in fact done by the above and following operations. It becomes more advantageous when the price gets above 12s.

Suppose 147 yards at 14s. per yard.

$$\begin{array}{r} 147 \\ 7 = \frac{1}{2} \text{ of } 14. \\ \hline \text{£}102 \cdot 18 \text{ Ans.} \\ \hline \end{array}$$

What will 347 yards come to at 16s. per yard?

$$\begin{array}{r} 347 \\ 8 \\ \hline \text{£}277 \cdot 12 \text{ Ans.} \\ \hline \end{array}$$

Here the $\frac{1}{2}$ of 16 is 8, which being placed under the 347, say 8 times 7 are 56, double the 6, which makes 12, put it down for shillings and carry 5; then 8 times 4 are 32, and 5 to carry are 37, put down 7 and carry 3; then 8 times 3 are 24, and 3 are 27, make £277. 12s.

Should the price not be even, multiply $\frac{1}{2}$ the quantity by all the shillings, and double the unit figure as before.

$$\begin{array}{r} \text{as } 342 \text{ at } 17s. \\ 171 \\ 17 \\ \hline \text{£}290 \cdot 14 \text{ Ans.} \\ \hline \end{array}$$

Or, multiply 342 by 8, doubling the unit figure, which gives the price at 16s.; then for 1s. per yard difference, add £8 . 11s. the amount at 1s.

thus, 342

$$\begin{array}{r} 8 \\ \hline 273 \cdot 12 \text{ at } 16s. \\ 17 \cdot 2 \text{ at } 1s. \\ \hline \end{array}$$

L. 290 . 14 Ans.

or, 456 at 24s.

$$\begin{array}{r} 156 \\ 12 \\ \hline \end{array}$$

L. 187 . 4 Ans.

Another method, by which may be found the amount of many articles in a short and simple manner, as follows—**RULE.** Consider the pence in the price of one Article as shillings, by which you have the price of twelve Articles, which being multiplied by the number of dozens in the quantity, gives the total amount.

DEMONSTRATION.

When the pence in the price of one Article is converted into shillings, it is clear you then have the amount of twelve Articles; that being multiplied by the number of twelves in the entire quantity, must give the total amount, and save much time, figures and trouble, besides giving the result with the most perfect accuracy.

EXAMPLES.

WHAT will 72 come to at 3s. 5d. each ?

3s. 5d. = 41d.; as shillings = £2 . 1 the price of
6 one dozen.

$$\begin{array}{r} \text{£}12 \cdot 6 \text{ Ans.} \end{array}$$

It is multiplied by 6, because there are 6 doz. in 72.
What will 84 come to at 12s. 10d. each ?

12s. 10d. = 154d. as shillings = £7 . 14 for 1 doz.

$$\begin{array}{r} \text{£}53 \cdot 18 \text{ Ans.} \end{array}$$

What will 108 come to at 9s. 5½d. each ?

9s. 5½d. = 113½d.; as shillings = £5 . 13 . 6 for 1 doz.

$$\begin{array}{r} \text{£}51 \cdot 1 \cdot 6 \text{ Ans.} \end{array}$$

What will 126 come to at 15s. 8¾d. each ?

15s. 8¾d. = 188¾d.; as shillings = £9 . 8 . 9
10½

$$\begin{array}{r} \text{£}99 \cdot 1 \cdot 10\frac{1}{2} \text{ Ans.} \end{array}$$

Here £9 . 8 . 9 the price of one dozen, is multiplied by 10½, because 126 are equal to 10½ dozen.

What will 147 gallons come to at 17s. 7¼d. per gallon ?

17s. 7¼d. = 211¼d.; as shillings = £10 . 11 . 3
12¼

$$\begin{array}{r} \text{Ans. } \text{£}129 \cdot 7 \cdot 9\frac{3}{4} \end{array}$$

What will 25 hats be worth at 3s. 7d. each?

3s. 7d. = 13d.; as shillings = £2 . 3 the price of 1 doz.
2 3s. 7d. to take in.

—————
£1 . 9 . 7 *Ans.*
—————

Note, The 3s. 7d. taken in when multiplying, is for the one difference between 24 (the quantity found when £2. 3s. is multiplied by 2) and the desired quantity, 25.

If the calculator prefer it, the overplus, after multiplying by the proper figure, may be added. Thus:

Suppose 62 yards of cloth at 5s. 7d. per yard.

5s. 7d. = 67d.; as shillings = £3 . 7

5 dozen, giving the
price of 60.
—————
£16 . 15
11 . 2 The 2 deficient
————— at 5s. 7d. each to
Ans. £17 . 6 . 2 add, being 11s.
————— 2d.

What will a chest of tea, containing 85 lbs., cost at 4s.

$2\frac{1}{2}d.$ per lb.?

4s. $2\frac{1}{2}d.$ = $50\frac{1}{2}d.$; as shillings = £2 . 10 . 6 take in for 1 lb.
7 4s. $2\frac{1}{2}d.$ when
————— multiplying by

Ans. £17 . 17 . $8\frac{1}{2}$ 7.
—————

What will 96 $\frac{1}{2}$ lbs. of tea come to at 7s. $6\frac{3}{4}d.$ per lb.?

7s. $6\frac{3}{4}d.$ = $90\frac{3}{4}d.$; as shill. = £4 . 10 . 9 3s. $9\frac{3}{8}d.$ to take
8 in for the $\frac{1}{2} lb.$
————— above the 8 doz.

Ans. £36 . 9 . $9\frac{3}{8} lbs.$

If the quantity be under a certain number of dozens adopt the same system, observing to subtract the overplus. Thus:

Suppose 71 yards of cloth at 7s. $10\frac{1}{4}d.$ per yard.

7s. $10\frac{1}{4}d.$ = $94\frac{1}{4}d.$; as shill = £4 . 14 . 3

6 amount of 72.
—————
28 . 5 . 6
7 . $10\frac{1}{4}$ deduct for 1yd.
————— the overplus.
Ans. £27 . 17 . $7\frac{3}{4}$
—————

What will 142 yards come to at 11s. $2\frac{1}{8}d.$ per yard?
 $11s. 2\frac{1}{8}d. = 134\frac{1}{8}d. = £6. 14. 1\frac{1}{2}$ price of 12 yards.

$$\begin{array}{r}
 12 \\
 \hline
 80. 9. 6 \text{ price of 144; too much} \\
 1. 2. 4\frac{1}{4} \text{ by 2 to deduct} = £1. 2. \\
 \hline
 4\frac{1}{4}. \\
 \hline
 \text{Ans. } £79. 7. 1\frac{3}{4}
 \end{array}$$

What will 168 gallons of rum come to at 11s. $8\frac{3}{8}d.$ per gallon?

$$\begin{array}{r}
 11s. 8\frac{3}{8}d. = 140\frac{3}{8}s. \text{ or } £7. 0. 4\frac{1}{2} \\
 14 \\
 \hline
 £98. 5. 3 \text{ Ans.} \\
 \hline
 \hline
 \end{array}$$

The simplicity, accuracy and expedition of the foregoing, does not stand in need of comment, its practical utility being perfectly conspicuous.

RULE for reducing *cwts. qrs. and lbs.* to *lbs.*—First place down the number of *cwts.*, to the right of them put the number of *lbs.* contained in the *qrs.* and *lbs.*, then add 12 *lbs.* for each *cwt.* and you will have the number of *lbs.* in the whole.

Should the price per *lb.* be pence, consider them as pence; if shillings, consider them as shillings, as fully explained in the following

EXAMPLES.

WHAT will 6 *cwt.* 1 *qr.* 20 *lbs.* cost at 5*d.* per *lb.*?

$$\begin{array}{r}
 648 \\
 72 \\
 \hline
 720 \text{ lbs. as pence} = 60s. \text{ or } £3. \text{ at } 1d. \text{ per } lb. \\
 5 \\
 \hline
 £15 \text{ Ans.}
 \end{array}$$

DEMONSTRATION.

The 6 to the left is the 6 *cwt.*; the 48 after it is the 28 *lbs.* in the *qr.* and the 20 *lbs.*; the placing of the 48 (or any two figures) after the preceding figure, is well known to convert them into numeral hundreds, thus, (100); but as each *cwt.* contains 112 *lbs.*, it is clear that there are 12 *lbs.* deficient for each *cwt.*; hence the necessity for adding 12 *lbs.* for each *cwt.*

Having discovered the number of *lbs.* in any given

number of *cwts.* *qrs.* and *lbs.*, which is done by the foregoing rule and example, you then proceed to find what the article amounts to, at any given *pence*, by the First General Rule, page 1: and at any given *shillings*, by the Second General Rule, page 10: which it will be necessary for any person studying this Book to become well acquainted with.

What will 7 *cwt.* 2 *qrs.* 0 *lbs.* cost at 7*d.* per *lb.*?

$$\begin{array}{r}
 756 \\
 \underline{84} \\
 12 \overline{)340} \text{ lbs. considered as pence.} \\
 \underline{70s. = \pounds 3.10.} \text{ at 1d. per lb.} \\
 \quad \quad \quad 7 \\
 \hline
 \pounds 24.10 \text{ Ans.}
 \end{array}$$

What will 8 *cwt.* 2 *qrs.* 8 *lbs.* come to at 5 $\frac{3}{4}$ *d.* per *lb.*?

$$\begin{array}{r}
 864 \\
 \underline{96} \\
 12 \overline{)960} \text{ lbs. as pence.} \\
 \underline{80s. = \pounds 4.} \text{ at 1d. per lb.} \\
 \quad \quad \quad 5\frac{3}{4} \\
 \hline
 \pounds 23 \text{ Ans.}
 \end{array}$$

The same example by Rule of Three.

<i>lb.</i>	<i>d.</i>	<i>cwt qrs lbs.</i>
1	: 5 $\frac{3}{4}$	: : 8 . 2 . 8
	4	4
farthings	<u>23</u>	<u>34</u>
		28
		<u>280</u>
		68
		<u>960 lbs.</u>
		23
		<u>2880</u>
		1920
		<u>4)22080</u> as farthings.
		<u>12)5520</u> as pence.
		<u>2)046|0</u> as shillings.
		<u>\pounds 23</u> Ans.

What will 9 *cwt.* 2 *qrs.* 16 *lbs.* cost at $6\frac{1}{2}d.$ per *lb.*?

$$\begin{array}{r} 972 \\ 108 \\ \hline 12)1080 \\ \hline \end{array} \quad \begin{array}{l} \text{£. s.} \\ 90s. = 4 \cdot 10 \text{ at } 1d. \text{ per } lb. \\ \quad 6\frac{1}{2} \\ \hline \end{array}$$

L. 29 . 5 *Ans.*

What will 10 *cwt.* 3 *qrs.* 8 *lbs.* come to at $8d.$ per *lb.*?

$$\begin{array}{r} 1092 \\ 120 \\ \hline 12)1212 \\ \hline \end{array} \quad \begin{array}{l} \text{L. s.} \\ 101s. = 5 \cdot 1 \text{ at } 1d. \text{ per } lb. \\ \quad 8 \\ \hline \end{array}$$

L. 40 . 8 *Ans.*

What is the price of 11 *cwt.* 3 *qrs.* 4 *lbs.* at $9\frac{1}{2}d.$ per *lb.*?

$$\begin{array}{r} 1188 \\ 132 \\ \hline 12)1320 \\ \hline \end{array} \quad \begin{array}{l} \text{L. s.} \\ 110s. = 5 \cdot 10 \text{ at } 1d. \\ \quad 9\frac{1}{2} \\ \hline \end{array} \quad \begin{array}{l} \text{L. } 2 \cdot 15. \text{ to bring in.} \\ \hline \end{array}$$

L. 52 . 5 *Ans.*

What will 12 *cwt.* 3 *qrs.* 12 *lbs.* come to at $10\frac{1}{4}d.$ per *lb.*?

$$\begin{array}{r} 1296 \\ 144 \\ \hline \end{array} \quad \begin{array}{l} \text{L.} \\ 1440d. = 6 \text{ at } 1d. \\ \quad 10\frac{1}{4} \\ \hline \end{array}$$

L. 61 . 10 *Ans.*

What will 12 *cwt.* 3 *qrs.* 24 *lbs.* cost at $10\frac{1}{2}d.$ per *lb.*?

$$\begin{array}{r} 1308 \\ 144 \\ \hline 12)1452 \\ \hline \end{array} \quad \begin{array}{l} \text{L. s.} \\ 121s. = 6 \cdot 1 \text{ at } 1d. \text{ per } lb. \\ \quad 10\frac{1}{2} \\ \hline \end{array}$$

L. 63 . 10 . 6 *Ans.*

It must be observed, that when the *qrs.* and *lbs.* reduced to *lbs.* exceed 100, they must not be placed after the *cwts.* as heretofore, but added in, saying 3 *qrs.* and 24 *lbs.* make 108, and 12 hundred are equal to 1308

What will 15 *cwt.* 0 *qrs.* 0 *lbs.* cost at $10\frac{3}{4}d.$ per *lb*?

$$\begin{array}{r}
 1500 \\
 180 \\
 \hline
 12)1680 \\
 \hline
 \quad L. \\
 \quad 140s. = 7 \\
 \quad \quad 10\frac{3}{4} \\
 \hline
 \quad L. 75 . 5 \text{ Ans.} \\
 \hline
 \end{array}$$

When there are no *qrs.* or *lbs.* two ciphers must be added, as the *cwt.* must be reckoned as numerical hundreds, as 100, to which 12 *lbs.* must be added to make it 112 *lbs.* the number of *lbs.* in a *cwt.*

What will 17 *cwt.* 0 *qrs.* 16 *lbs.* cost at $11\frac{3}{4}d.$ per *lb*?

$$\begin{array}{r}
 1716 \\
 204 \\
 \hline
 12)1920 \\
 \hline
 \quad L. \\
 \quad 160s. = 8 \text{ at } 1d. \\
 \quad \quad 11\frac{3}{4} \\
 \hline
 \quad L. 94 \text{ Ans.} \\
 \hline
 \end{array}$$

It is hoped that the above examples, at *pence* per *lb.* will be found sufficient; we beg to introduce examples where the price is shillings per *lb.*

What will 18 *cwt.* 2 *qrs.* 12¹/₂ *lbs.* come to at 2s. 6d. per *lb*?

$$\begin{array}{r}
 1868 \\
 216 \\
 \hline
 2s. 6d. \text{ of a } L. \text{ is } \frac{1}{8})2084 \\
 \hline
 \quad L. 260 . 10 \text{ Ans.} \\
 \hline
 \end{array}$$

When the price is an aliquot part of a *L.* as the above is one-eighth, nothing can be shorter than to take such part.

What will 1 t. 12 cwt. 3 qrs. 8 lbs. come to at 1s. 4d. per lb?

$$\begin{array}{r}
 3292 \\
 384 \\
 \hline
 1s. 4d. \text{ of a } \pounds \text{ is } \frac{1}{12})3676 \\
 \hline
 \hline
 L. 245 \cdot 1 \cdot 4 \text{ Ans.}
 \end{array}$$

What will 3 t. 6 cwt. 3 qrs. 14 lbs. cost at 1s. 8d. per lb?

$$\begin{array}{r}
 6698 \\
 792 \\
 \hline
 1s. 8d. \text{ of a } L. \text{ is } \frac{1}{12})7490 \\
 \hline
 \hline
 L. 624 \cdot 3 \cdot 4 \text{ Ans.}
 \end{array}$$

What will 5 t. 5 cwt. 3 qrs. 12 lbs. cost at 3s. per lb?

$$\begin{array}{r}
 10596 \\
 1260 \\
 \hline
 L. \quad s. \\
 11856s. = 592 \cdot 16 \text{ at } 1s. \\
 3 \\
 \hline
 L. 1778 \cdot 8 \text{ Ans.}
 \end{array}$$

Calculations of *cwts.*, *qrs.*, and *lbs.* at *pounds*, *shillings* and *pence* per *cwt.* may be done by the following methods.

What will 6 cwt. 2 qrs. come to at 66s. 8d. per cwt?

$$\begin{array}{l}
 L. 3 \cdot 6 \cdot 8 \text{ price of 1 cwt.} \\
 6\frac{1}{2} \text{ cwt. } L. 1 \cdot 13 \cdot 4 \text{ to bring in.} \\
 \hline
 L. 21 \cdot 13 \cdot 4 \text{ Ans.}
 \end{array}$$

Many calculations of *cwts.*, *qrs.* and *lbs.* at *pounds*, *shillings* and *pence* per *cwt.* may be much shortened by finding the price per *lb.* as follows:

Per lb.	Per cwt.	Per lb.	Per cwt.	Per lb.	Per cwt.	Per lb.	Per cwt.
<i>d.</i>	$\pounds \quad s. \quad d.$	<i>d.</i>	$\pounds \quad s. \quad d.$	<i>d.</i>	$\pounds \quad s. \quad d.$	<i>d.</i>	$\pounds \quad s. \quad d.$
$\frac{1}{4}$ is	0 2 4	$3\frac{1}{2}$ is	1 12 8	$6\frac{3}{4}$ is	3 3 0	10 is	4 13 4
$\frac{1}{2}$ "	0 4 8	$3\frac{3}{4}$ "	1 15 0	7 "	3 5 4	$10\frac{1}{2}$ "	4 15 8
$\frac{3}{4}$ "	0 7 0	4 "	1 17 4	$7\frac{1}{4}$ "	3 7 8	$10\frac{1}{4}$ "	4 18 0
1 "	0 9 4	$4\frac{1}{4}$ "	1 19 8	$7\frac{1}{2}$ "	3 10 0	$10\frac{3}{4}$ "	5 0 4
$1\frac{1}{4}$ "	0 11 8	$4\frac{1}{2}$ "	2 2 0	$7\frac{3}{4}$ "	3 12 4	11 "	5 2 8
$1\frac{1}{2}$ "	0 14 0	$4\frac{3}{4}$ "	2 4 4	8 "	3 14 8	$11\frac{1}{4}$ "	5 5 0
$1\frac{3}{4}$ "	0 16 4	5 "	2 6 8	$8\frac{1}{4}$ "	3 17 0	$11\frac{1}{2}$ "	5 7 4
2 "	0 18 8	$5\frac{1}{4}$ "	2 9 0	$8\frac{1}{2}$ "	3 19 4	$11\frac{3}{4}$ "	5 9 8
$2\frac{1}{4}$ "	1 1 0	$5\frac{1}{2}$ "	2 11 4	$8\frac{3}{4}$ "	4 1 8	12 "	5 12 0
$2\frac{1}{2}$ "	1 3 4	$5\frac{3}{4}$ "	2 13 8	9 "	4 4 0	$12\frac{1}{4}$ "	5 14 4
$2\frac{3}{4}$ "	1 5 8	6 "	2 16 0	$9\frac{1}{4}$ "	4 6 4	$12\frac{1}{2}$ "	5 16 8
3 "	1 8 0	$6\frac{1}{4}$ "	2 18 4	$9\frac{1}{2}$ "	4 8 8	$12\frac{3}{4}$ "	5 19 0
$3\frac{1}{4}$ "	1 10 4	$6\frac{1}{2}$ "	3 0 8	$9\frac{3}{4}$ "	4 11 0	13 "	6 1 4

What will 6 *cwt.* 3 *qrs.* 20 *lbs.* cost at $L.2 \cdot 6 \cdot 8$ per *cwt*?

$$\begin{array}{r}
 \text{Buy } L.2 \cdot 6 \cdot 8 \text{ per } cwt. \\
 \hline
 \phantom{\text{ per } cwt.} \\
 \phantom{\text{ price of 7 } cwt.} \\
 \text{deduct } \phantom{\text{ price of 8 } lbs.} \\
 \hline
 L \ 16 \cdot 3 \cdot 4 \text{ Ans.} \\
 \hline
 \end{array}$$

When the *qrs.* and *lbs.* come near a *cwt.* calculate for the *cwts.* above your quantity, from which deduct for as many *lbs.* as may be deficient, as per

EXAMPLES.

What will 11 *cwt.* 3 *qrs.* 24 *lbs.* cost at 84s. per *cwt*?

$$\begin{array}{r}
 L. 4 \cdot 4 \text{ per } cwt. \\
 \phantom{\text{ per } cwt.} \\
 \phantom{\text{ price of 12 } cwt.} \\
 \phantom{\text{ 3 deduct for 4 } lbs.} \\
 \hline
 L \ 50 \cdot 5 \text{ Ans.} \\
 \hline
 \end{array}$$

It will be seen by the foregoing table that $L. 4 \cdot 4$ per *cwt.* is 9d. per *lb.*

What will 9 *cwt.* 3 *qrs.* 27 *lbs.* come to at 93s. 4d. per *cwt*?

$$\begin{array}{r}
 L \ 4 \cdot 13 \cdot 4 \text{ per } cwt. \\
 \phantom{\text{ per } cwt.} \\
 \phantom{\text{ 10d.}} \\
 \phantom{\text{ being 10d.}} \\
 \phantom{\text{ per } lb., \text{ for 1 } lb. \text{ de-}} \\
 \phantom{\text{ duct 10d.}} \\
 \phantom{\text{ 10 deduct for 1 } lb.} \\
 \hline
 L. 46 \cdot 12 \cdot 6 \text{ Ans.} \\
 \hline
 \end{array}$$

What will 11 *cwt.* 3 *qrs.* 22 *lbs.* cost at 112s. per *cwt*?

$$\begin{array}{r}
 L. 5 \cdot 12 \text{ per } cwt. \\
 \phantom{\text{ per } cwt.} \\
 \phantom{\text{ 12}} \\
 \phantom{\text{ 4 for 12 } cwt.} \\
 \phantom{\text{ 6 deduct for 6 } lbs.} \\
 \hline
 L. 66 \cdot 18 \text{ Ans.} \\
 \hline
 \end{array}$$

112s. per *cwt.* is 1s. per *lb.*

What will 8 *cwt.* 2 *qrs.* come to at 110s. 6d. per *cwt.*

$$\begin{array}{r}
 L. 5 \cdot 10 \cdot 6 \\
 \\
 \phantom{\text{ 8}} \\
 \phantom{\text{ 1/2}} \\
 \hline
 L. 46 \cdot 19 \cdot 3 \text{ Ans.} \\
 \hline
 \end{array}$$

$L. 2 \cdot 15 \cdot 3$ to bring in.

Consider the *acres* as *pounds*, multiply the *roods* by 5, the product consider as *shillings*, and the *perches* by $1\frac{1}{2}d.$ gives the amount of the whole at *L.1* per *acre*, which multiply by the number of *pounds* per *acre*.

EXAMPLES:

WHAT will 60 *a.* 2 *r.* 8 *p.* come to at *L.3* : 10 per *acre*?

$$\begin{array}{r}
 a. \quad r. \quad p. \\
 60 : 2 : 8 \\
 \quad \quad 5 : 1\frac{1}{2} \\
 \hline
 60 : 11 : 0 \quad \text{at } L. 1 \text{ per } \text{acre.} \\
 \quad \quad \quad 3\frac{1}{2} \\
 \hline
 \underline{L.211 : 18 : 6} \quad \text{Ans.} \quad L 30 : 5 : 6 \text{ to bring in.}
 \end{array}$$

DEMONSTRATION.

As a perch is the 40th part of a rood, and a rood at *L.1* per *acre* = *5s.* multiply the perches by $1\frac{1}{2}d.$ which gives in this case *1s.*; then 5 times 2 are 10, and 1 to carry makes *11s.*; bring down 60 at *L.1* per *acre*, gives the total at *L.1* per *acre*, which being multiplied by $3\frac{1}{2}$ gives the answer.

What will 80 *a.* 3 *r.* 24 *p.* come to at *L.4* . 6 . 8 per *acre*?

$$\begin{array}{r}
 a. \quad r. \quad p. \\
 80 : 3 : 24 \\
 \quad \quad 5 : 1\frac{1}{2} \\
 \hline
 80 : 18 : 0 \quad \text{at } L. 1 \\
 \quad \quad \quad 4\frac{1}{2} \quad L. 26 : 19 : 4 \text{ to bring in.} \\
 \hline
 \underline{L.350 : 11 : 4} \quad \text{Ans.}
 \end{array}$$

What will 196 *a.* 2 *r.* 36 *p.* come to at *L.5* . 19 . 10 per *acre*?

$$\begin{array}{r}
 a. \quad r. \quad p. \\
 196 : 2 : 36 \\
 \quad \quad 5 : 1\frac{1}{2} \\
 \hline
 196 : 14 : 6 \quad \text{at } 1 L. \\
 \quad \quad \quad 6 \\
 \hline
 1180 : 7 . 0 \quad \text{at } 6 L \\
 \quad \quad 1 : 12 : 9\frac{1}{2} \quad \text{deduct for } 2d. \\
 \hline
 \underline{\pounds 1178 : 14 : 2\frac{1}{2}} \quad \text{Ans.}
 \end{array}$$

In this operation, the price being nearly £6 per acre, it has been calculated at that price, which being 2*d.* per acre more than the price, the number of acres, &c. at 2*d.* have been deducted from it.

What will 575 *a.* 3 *r.* 26 *p.* come to at £7 . 1 per acre?

$$\begin{array}{r}
 \text{a. r. p.} \\
 575 \cdot 3 \cdot 26 \\
 \quad \quad 5 \cdot 1\frac{1}{2} \\
 \hline
 575 \cdot 18 \cdot 3 \quad \text{at } \text{£}1 \text{ per acre.} \\
 \quad \quad \quad 7 \\
 \hline
 4031 \cdot 7 \cdot 9 \quad \text{at } \text{£}7. \\
 \quad \quad 28 \cdot 15 \cdot 10\frac{3}{4} \quad \text{at } 1\text{s.} \\
 \hline
 \text{£}4060 \cdot 3 \cdot 7\frac{3}{4} \quad \text{Ans.} \\
 \hline
 \hline
 \end{array}$$

In treating on this description of calculations, Troy Weight, consisting of *lbs.* *oz.* *dwt.* and *grs.* I shall give Rules for solving in a similar manner by the following simple RULE.

Consider the *grs.* as *halfpence*, the *dwt.* as *shillings*, and the *ounces* as *pounds*, which gives the amount of the whole at £1 per *oz.*

EXAMPLES.

WHAT will 11 *oz.* 8 *dwt.* 4 *grs.* cost at 3*s.* 4*d.* per ounce?

$$\begin{array}{r}
 \text{oz. dwt. grs.} \\
 11 \cdot 8 \cdot 4 \\
 \quad \quad 1 \cdot 0\frac{1}{2} \\
 \hline
 3\text{s. } 4\text{d.} = \text{£}\frac{1}{6}.) 11 \cdot 8 \cdot 2 \quad \text{at } \text{£}1 \text{ per ounce.} \\
 \hline
 \text{£}1 \cdot 18 \cdot 0\frac{1}{3} \quad \text{Ans.} \\
 \hline
 \hline
 \end{array}$$

DEMONSTRATION.

The 8 *dwt.* are considered as shillings, because there are 20 *dwt.* in the *oz.* and the *ounces* at £1 per *oz.* would give 1 shilling for each *dwt.*; the *grs.* are considered as $\frac{1}{2}$ *d.* each, on account of there being 24 *dwt.* to the *grain*, consequently each *grain* at $\frac{1}{2}$ *d.* each, and *dwt.* at 1*s.* each, will give the amount of the entire quantity at £1 per *oz.* which you must multiply or divide, as the price will require, and as the following examples more fully explain.

The £70 . 0 . 10 being the amount of the following quantity at £1 per oz it is divided by 20, which gives the amount at 1 shilling per oz. and that is multiplied by $8\frac{1}{2}$ as the price is $8\frac{1}{2}$ shillings, or 8s. 6d. per oz:

What will 5 lb. 10 oz. 0 dwts. 20 grs. come to at 8s. 6d. per ounce?

$$\begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 70 \cdot 0 \cdot 10 \\
 3 \cdot 10 \cdot 0\frac{1}{2} \quad \text{at } 1\text{s.} \\
 \quad \quad \quad 8\frac{1}{2} \\
 \hline
 \text{£}29 \cdot 15 \cdot 4\frac{1}{4}
 \end{array}$$

147 oz. 16 dwts and 18 grs. of gold at £3 per oz.

$$\begin{array}{r}
 \text{£}147 \cdot 16 \cdot 9 \quad \text{at } \text{£}1 \text{ per oz.} \\
 3 \\
 \hline
 \text{£}443 \cdot 10 \cdot 3 \quad \text{Ans.}
 \end{array}$$

181 oz. 15 dwts. 0 grs. at £4 . 0 . 1 per oz.

$$\begin{array}{r}
 \text{£}181 \cdot 15 \cdot 0 \quad \text{at } \text{£}1 \text{ per oz.} \\
 4 \\
 \hline
 \text{£}727 \cdot 15 \cdot 1\frac{3}{4} \quad \text{Ans.}
 \end{array}
 \quad \begin{array}{l}
 15\text{s. } 1\frac{3}{4}\text{d. at } 1\text{d to} \\
 \text{bring in.}
 \end{array}$$

AVERAGE CALCULATIONS.

The following average calculations have afforded the greatest satisfaction to all who have studied them for the singularly short method by which they have been worked, and the perfect accuracy of the answers.

EXAMPLES.

WHAT will 6 pieces of riband come to, each piece containing 36 yards, at the following prices, and what is the average price of each yard?

1 piece at 4d. per yard.	
1 5d.	6 pieces of 36 yards each,
1 6d.	at 1d. per yard = 18s.
1 7d.	7
1 8d.	7
1 12d.	total £6 . 6

$$\begin{array}{r}
 6 \overline{)42d.} \\
 \text{Ans. } 7d. \quad \text{per yard average.}
 \end{array}$$

DEMONSTRATION.

In this and the following Calculations the prices are added together, which being divided by the number of prices gives the average price per yard, the amount of the whole being made up at one penny, and multiplied by the average price, gives the total amount.

What will 100 lambs come to, purchased at the following prices ?

	s.	d.
20 lambs at 4 . 4 each.		
20	4	3
20	6	0
20	8	2
20	11	10

$$\begin{array}{r} \hline 5)35 \cdot 0 \\ \hline \end{array}$$

Ans. 7s. the average price.

$$100 \text{ lambs at } 1s. \text{ equal to } \underline{\underline{\pounds 5}} \\ 7$$

$\pounds 35$ total.

500 yards of silk at the following prices: What is the total amount and average price of each yard ?

100 yards at 5s. 3d. per yard.	
100	5 . 9
100	7 . 0
100	8 . 11
100	15 . 7

$$500 \text{ yards at } 1s. = \underline{\underline{\pounds 25}} \\ 8\frac{1}{2}$$

total $\pounds 212 \cdot 10$

$$\begin{array}{r} \hline 5)42 \cdot 6 \\ \hline \end{array}$$

s. 8 . 6 average per yard.

What is the average price, and total amount of a case of 200 hats, at the following prices ?

50 hats at 15s. $3\frac{1}{2}d.$ each.	
50	15 . $8\frac{1}{2}$
50	17 . 6
50	19 . 10

$$\begin{array}{r} \hline 4)68 \cdot 4 \\ \hline \end{array}$$

s. 17 . 1 average.

$$200 \text{ at } 1s. = \pounds 10 \cdot 0 \quad 200 \text{ at } 1d. = 16s. 8d. \\ 17 \cdot 1 \text{ to bring in.}$$

$$\underline{\underline{\pounds 170 \cdot 16 \cdot 8}}$$

What is the average price, and total amount, of 900 lambs, at the following prices?

300 lambs at 9s. 9d. each.

300 11 . 5

300 12 . 7

3)33 . 9

s. 11 . 3 average.

900 at 1s. each = £45.

11 $\frac{1}{4}$

£506 . 5 total.

What will 12 pieces of riband come to, each piece averaging 48 yards, and what is the average price of each yard at the following prices?

2 pieces at 2 $\frac{1}{2}$ d. per yard.

2 3 $\frac{1}{2}$

2 6 $\frac{1}{4}$

2 7 $\frac{3}{4}$

2 9 $\frac{3}{4}$

2 12 $\frac{1}{4}$

12 pieces, 48 yards each,
at 1d. per yard = £2 . 8 . 0

7

total £16 . 16 . 0

6)42

7d. a yard average.

A library containing 100 books at the following prices; required to find the average price of each book, and total amount.

10 books at 2s. 4 $\frac{1}{2}$ d. each.

10 3 . 7 $\frac{1}{2}$

10 4 . 4 $\frac{3}{4}$

10 5 . 7 $\frac{1}{4}$

10 6 . 7 $\frac{1}{4}$

10 7 . 5 $\frac{1}{4}$

10 8 . 6 $\frac{3}{4}$

10 9 . 4 $\frac{1}{4}$

10 9 . 9 $\frac{3}{4}$

10 12 . 7 $\frac{1}{4}$

100 books at
1s. each = £5 . 0 . 0

7 . 0 $\frac{1}{2}$

total £35 . 4 . 2

10)70 . 5

s. 7 . 0 $\frac{1}{2}$ average price of each book.

Twenty-two casks of prunes, the average weight of each cask supposing to be 34 $\frac{1}{2}$ lbs., at the following

prices, required to find the average price of each *lb.* and the total amount.

2	casks	at	$2\frac{3}{4}$	d.	per	<i>lb.</i>
2	.....		$4\frac{1}{2}$			
2	.....		$4\frac{3}{4}$			
2	.....		$6\frac{1}{2}$			
2	.....		$7\frac{1}{2}$			
2	.....		$7\frac{3}{4}$			
2	.....		$8\frac{1}{2}$			
2	.....		$9\frac{3}{4}$			
2	.....		$11\frac{1}{4}$			
2	.....		$11\frac{1}{2}$			
2	.....		$13\frac{1}{4}$			
			11)88			

8d. per *lb.* average.

22 casks.

7s. price of 1 cask at *1d.* per *lb.*

154s. = £7.14 . 0 being the amount of all at *1d.*
 Multip. by 8d. being the average price.

£61.12 . 0 total amount. *Ans.*

The above calculation takes more than five hundred figures to do it in the ordinary method, either by the Rule of Three, or by Practice, the few figures taken by this system are comparatively trifling.

110 gross of buttons at the following prices, required to find the average price of each gross, and the total amount.

10	gross	at	1s.	$5\frac{1}{2}$	d.	per	gross.
10	.....		2	$0\frac{1}{2}$			
10	.....		2	$4\frac{3}{4}$			
10	.....		3	$1\frac{1}{4}$			
10	.....		3	$8\frac{1}{4}$			
10	.....		3	$9\frac{3}{4}$			
10	.....		4	$5\frac{1}{4}$			
10	.....		5	$0\frac{3}{4}$			
10	.....		5	$4\frac{3}{4}$			
10	.....		6	$1\frac{1}{4}$			
10	.....		8	. 4			
			11)45.10				

110 gross at 1s.
 per gross = £5.10 . 0
4 . 2

Ans. £22.18 . 4

s. 4 . 2 average per gross.

As the persons who may possess this book would probably be anxious to know how to work calculations of a similar nature to the foregoing, when the quantities are not equal, in order to meet their wishes, the Author subjoins a variety of calculations of the following description:

Twelve dozen pair of stockings purchased at the following prices, required to find the average price of each pair and the total amount.

	s.	d.		s.	d.
2 dozen pair at 2 . 3 per pair =			=	4 .	6
3 2 . 6 =			=	7 .	6
4 2 . 9 =			=	11 .	0
2 3 . 0 =			=	6 .	0
1 4 . 0 =			=	4 .	0
				12)33 . 0 price of 12 pair.	
				s. 2 . 9 average pr. pair.	
12 dozen pair at 1s. per pair =	£7 .	4 .	0		
				2 ³ / ₄	
				£19 . 16 . 0 total amount.	

By the foregoing calculation (and the following to be done in like manner) it will be seen that the different pairs of stockings stated in the question, have been calculated at the prices stated per pair, which being added up gives the amount of twelve pair, and being divided by 12, gives the amount of each pair, which averages 2s. 9d. Then 12 dozen being 144 at 1s. gives £7 4. and which, being multiplied by the average price, 2s. 9d. or 2 ³/₄s. gives the total amount.

A library containing 100 Books at the following prices; required to know the average price, and total amount.

10 books at 2s. 6d each =			=	25s. 0d.
15 3 . 6 =			=	52 . 6
20 4 . 6 =			=	90 . 0
30 5 . 6 =			=	165 . 0
20 6 . 6 =			=	130 . 0
5 7 . 6 =			=	37 . 6
				100 books
				100)500s. or £25 total.
				5s. average price.

12 pieces of riband, each piece of 36 yards, at the following prices; required to know the average price and total amount.

1 piece	at $3\frac{1}{2}d.$	per yard	=	$3\frac{1}{2}d.$
2.....	$4\frac{1}{2}$	.....	=	9
3.....	$5\frac{1}{2}$	.....	=	$16\frac{1}{2}$
4.....	$6\frac{1}{2}$	.....	=	26
2.....	$8\frac{1}{2}$	.....	=	17
<hr/>				
12 pieces				12)72
<hr/>				

$6d.$ per yard average.

12 pieces at $1d.$ per yard = £ 1.16
6

£10.16 Ans.

5 pieces of silk at the following lengths and prices; required to know the average price of each yard, and the total amount.

	<i>s.</i>	<i>d.</i>		<i>s.</i>	<i>d.</i>
1 piece of 20 yards at	2	6	per yard =	50	0
1.....25.....	3	6	.....=	87	6
1.....15.....	4	6	.....=	67	6
1.....25.....	6	0	.....=	150	0
1.....15.....	6	4	.....=	95	0
<hr/>					
	100			100)450	=£22.10
<hr/>					

$s. 4 . 6$ aver.

20 casks of raisins, each cask averaging 2 qrs. 16 lbs. sold in the following lots, and at the underwritten prices:

	<i>d.</i>	<i>d.</i>
3 casks at $4\frac{1}{2}$ per lb.	=	$13\frac{1}{2}$
5..... $5\frac{1}{2}$	=	$27\frac{1}{2}$
4..... $6\frac{1}{2}$	=	26
5..... $7\frac{1}{2}$	=	$37\frac{1}{2}$
3..... $8\frac{1}{2}$	=	$25\frac{1}{2}$
<hr/>		
20		20)130d.
<hr/>		

$6\frac{1}{2}d.$ per lb. average.

20 firkins, 2 qrs. 16 lbs. each at $1d.$ = £6
 $6\frac{1}{2}$

£39 total.

22 cases of figs, each case averaging 3 qrs. 15 lbs. sold in lots as follow, and at the following prices: required to know the average price per lb. and total amount.

	<i>d.</i>	<i>d.</i>
2 cases at $4\frac{1}{4}$ per lb. =	$8\frac{1}{2}$	
3..... $5\frac{3}{4}$ =	$17\frac{1}{4}$	
1..... $6\frac{1}{4}$ =	$6\frac{1}{4}$	
5..... $7\frac{1}{4}$ =	$36\frac{1}{4}$	
7..... $8\frac{3}{4}$ =	$61\frac{1}{4}$	
2..... $9\frac{1}{2}$ =	19	
2..... $16\frac{1}{2}$ =	33	
22		22)181 $\frac{1}{2}$

$8\frac{1}{4}$ average price per lb.

22 cases of 3 qrs. 15 lbs. each = £9 . 1 . 6 at 1d.

$8\frac{1}{4}$ £2 . 5 . 4 $\frac{1}{2}$
 _____ to bring in.

total amount £74 . 17 . 4 $\frac{1}{2}$

100 silk shawls, purchased in the following lots, and at the undermentioned prices:

10 shawls at 2s. 6d each =	25s. 0d.
12.....3 $8\frac{1}{2}$ =	44 3
15.....4 $6\frac{1}{2}$ =	68 1 $\frac{1}{2}$
20.....5 $3\frac{1}{2}$ =	105 10
15.....6 $4\frac{1}{2}$ =	95 7 $\frac{1}{2}$
10.....7 $9\frac{1}{2}$ =	77 11
12.....8 $5\frac{1}{2}$ =	101 6
6.....9 $5\frac{1}{2}$ =	56 9

100 100)575s. or £28 15 total.

s. 5 9 average price.

A cargo of coals, containing 120 tons, as follow:

First cost per ton	8s. 0d.
Freight	9 0
Duty	2 0

s. 19 0. per ton.

120 tons at 1s. per ton £6

£114 total amount.

A cargo of coals, containing 300 tons, as follow:

Prime cost per ton	7s. 6d.
Freight	8 6
Duty	1 6

s. 17 6 per ton.

300 tons at 1s. = £15

£262 10 Ans.

A ship containing 1000 tons of coal, as follow :

Prime cost 8s. 6d.

Freight - 8 . 1

Duty - 2 . 6

s. 19 . 1 per ton.

1000 tons at 1s. = £50 . 0

s. 19 . 1 1000 at 1d. = £4 . 3 . 4
to bring in.

total amount £954 . 3 . 4

5 puncheons of rum, as follow :

No. 1 containing 118 gallons:

2 119

3 120

4 121

5 122

600 gallons at 1s. = £30

13

total £390

600 gallons.

Prime cost per gallon 4s.

Freight - - - 1

Duty - - - 8

stands in 13s. per gallon. *Ans.*

What will 6 puncheons of rum come to as follow ?

No. 1 containing 115 gallons.

2 117

3 118

4 121

5 124

6 130

725 gallons = £36 . 5

14

total £507 . 10

gallons 725 at 1s. each.

Prime cost per gallon 4s.

Freight - - - 1

Duty - - - 9

stands in 14s. per gallon. *Ans.*

What will 6 pipes of brandy come to as follow ?

No. 1 containing $112\frac{2}{10}$

2 $114\frac{5}{10}$

3 $116\frac{6}{10}$

4 $118\frac{1}{10}$

5 $122\frac{2}{10}$

6 $137\frac{9}{10}$

$721\frac{1}{2}$ gallons at 1s. = £36 . 1 . 6

Prime cost per gallon 5s. 0d. 19 $\frac{1}{4}$

Freight - - - 1 . 6

Duty - - - 12 . 9 £694 . 8 . 10 $\frac{1}{2}$

stands in s. 19 . 3 per gallon. *Ans.*

In measuring liquids in the king's stores, the broken parts of a gallon are divided into tenths, and which accounts for the tenths being introduced into the preceding and following Questions:

What will 10 butts of Geneva come to as follow ?

No. 1 containing	113 $\frac{1}{10}$	gallons
2	114 $\frac{2}{10}$	
3	115 $\frac{3}{10}$	
4	116 $\frac{7}{10}$	
5	117 $\frac{9}{10}$	
6	119 $\frac{6}{10}$	
7	120 $\frac{2}{10}$	
8	125	
9	128 $\frac{1}{10}$	
10	132 $\frac{1}{10}$	

1202 $\frac{2}{10}$ gall. = £60 2 2 $\frac{2}{5}$ at 1s.
15

Prime cost per gallon	3s. 6d.	_____
Freight	1 6	£901 13 0
Duty	10 0	_____

stands in s. 15 0 per gallon. *Ans.*

Note, Tenths are added up like other fractions, by adding up the Numerators, or figures above the line, and dividing their product by 10 the Denominator; the $\frac{1}{10}$ ths. make 32, divided by 10 goes 3 times and leaves 2, which are $\frac{2}{10}$ or $\frac{1}{5}$ of a gallon, at 1s. per gallon, is $\frac{1}{5}$ of a shilling or 2 $\frac{2}{5}$ pence.

INTEREST.

INTEREST is the profit allowed by the borrower to the lender, for the loan of any sum of money, for a determined space of time.

The **Principal** is the money lent, for which Interest is to be received.

The rate per Cent. is a certain sum agreed on between the borrower and the lender, to be paid for the use of every £100. of the Principal twelve months.

The interest may be found alone, or the amount, by adding the Interest and Principal together.

We shall here introduce two Rules for Interest at £5 per Cent. both of which have given the greatest satisfaction in all instances.

FIRST RULE.

Multiply the Principal by the Months, and the Product in Pounds Sterling taken as Pence, will be the Answer.

Or thus, the Interest of each Pound for one Month at 5 per Cent. is one penny, and so in proportion for any part of a Pound, therefore, find the Interest for one Month, and Multiply it by the Number of Months, the Product will be the Answer at 5 per cent.

EXAMPLES.

What is the interest of £36 for three months?

$$\begin{array}{r} \text{£}36 \\ 3 \\ \hline \end{array} \quad \text{By first Rule.}$$

£108 taken as pence = 9s. *Ans.*

Or thus, £36 for one month = 3s.
multiplied by 3 months.

$$\begin{array}{r} 3 \\ \hline 9s. \text{ Ans.} \end{array}$$

The second rule being the shortest, and both equally accurate, it will be found most advantageous to adopt it.

What is the interest of £48 for 4 months at 5 per cent ?

$$\begin{array}{r} \text{£}48 \text{ for 1 month} = 4s. \\ \text{multiplied by 4 months.} \end{array}$$

$$\begin{array}{r} 4 \\ \hline 16s. \text{ Ans.} \end{array}$$

DEMONSTRATION,

To prove, by the Double Rule of Three, that the interest of each £. for one Month at £5. per cent. is one Penny.

$$\begin{array}{r} \text{£.} \quad \text{£.} \\ 100 \quad \left. \vphantom{\begin{array}{l} 100 \\ \text{mo. } 12 \end{array}} \right\} 5. \quad \left\{ \begin{array}{l} 1 \text{ £.} \\ 1 \text{ mo.} \end{array} \right. \\ \text{mo. } 12 \quad \left. \vphantom{\begin{array}{l} 100 \\ \text{mo. } 12 \end{array}} \right\} \\ \hline 1200 \end{array} \quad \begin{array}{r} \hline 1 \\ 5 \\ \hline \end{array}$$

£5
240 No. of pence in a £.

$$\begin{array}{r} \hline 1200 \end{array} 1200 (1 \text{ penny.})$$

It will be seen by those acquainted with the double Rule of Three, that this is the operation necessary to prove that the Interest of each *L.* for one month at 5 per Cent. is *1d.* and having established that fact, the propriety of finding the interest of money by either method given by us will appear clear and simple. Such as are not acquainted with the foregoing demonstration, may prove the truth of its being so, by this:

The Interest of *L.* 100 for 12 months at *L.* 5 per Cent. is allowed by all who know any thing of the subject to be *L.* 5 therefore the Interest of *L.* 100 for 1 month is the $\frac{1}{12}$ of *L.* 5 equal to *8s.* *4d.* consequently the Interest of *L.* 1 for a month must be the $\frac{1}{100}$ of *8s.* *4d.* which is *1d.*

What is the interest of *L.* 96 for 7 months at 5 per cent.?

interest for 1 month *8s.*

7

L. 2 . 16 *Ans.*

What is the interest of *L.* 108 for 2 months?

interest for 1 month = *9s.*

2

18s. *Ans.*

Find the interest of *L.* 132 for 8 months.

L. 132 for 1 month = *11s.*

8

L. 4 . 8 *Ans.*

Find the interest of *L.* 33 for 7 months.

L. 33 for 1 month = *2s.* *9d.*

7

s. 19 . 3 *Ans.*

What is the interest of *L.* 65 for 11 months?

L. 65 for 1 month = *5s.* *5d.*

11

L. 2 . 19 . 7 *Ans.*

What is the interest of $L.126$ for 10 months ?

10s. 6d. for 1 month.

10

$L.5 \cdot 5 \cdot 0$ Ans.

What is the interest of $L.148$ for 7 months ?

12s. 4d. for 1 month.

7

$L.4 \cdot 6 \cdot 4$ Ans.

What is the interest of $L.28 \cdot 10$ for three months ?

2s. $4\frac{1}{2}d.$ for 1 month.

3

$s.7 \cdot 1\frac{1}{2}$ Ans.

Here $L.28$ for 1 month is 28 pence, or 2s. 4d. and 10s. being half a pound is reckoned as $\frac{1}{2}$ a penny, gives the interest for 1 month, which being multiplied by 3 (the number of months) gives 7s. $1\frac{1}{2}d.$ the answer required.

What is the interest of $L.122 \cdot 10$ for 5 months ?

10s. $2\frac{1}{2}d.$ for 1 month.

5

$L.2 \cdot 11 \cdot 0\frac{1}{2}$ Ans.

Tell me the interest of $\pounds 150 \cdot 5$ for 11 months.

12s. $6\frac{1}{4}d.$ for 1 month.

11

$\pounds 6 \cdot 17 \cdot 8\frac{3}{4}$ Ans.

Here the interest of 5s. for 1 month at 5 per cent. is $\frac{1}{4}$ of a penny.

What is the interest of $\pounds 185 \cdot 5$ for 4 months ?

15s. $5\frac{1}{4}d.$ for 1 month.

4

$\pounds 3 \cdot 1 \cdot 9$ Ans.

What is the interest of $L.365 \cdot 15$ for 8 months ?

$\pounds 1 \cdot 10 \cdot 5\frac{3}{4}$ for 1 month.

8

$\pounds 12 \cdot 3 \cdot 10$ Ans.

Here for 15s. allow $\frac{3}{4}d.$ being the 3 quarters of a \pounds .

What is the interest of $L.420 . 15$ for 10 months?

$$L.1 . 15 . 0\frac{3}{4} \text{ for 1 month?}$$

$$L.17 . 10 . 7\frac{1}{2} \text{ Ans.}$$

What is the interest of $L 526 . 2 . 6$ for 7 months?

$$L.2 . 3 . 10\frac{1}{8} \text{ for 1 month.}$$

$$L.15 . 6 . 10\frac{7}{8} \text{ Ans.}$$

In this question $2s. 6d.$ being the $\frac{1}{8}$ of a $L.$ the $\frac{1}{8}$ of a penny is allowed for it.

What is the interest of $L.125$

$$10s. 5\frac{3}{8}d. \text{ for 1 month.}$$

$$L.1 . 0 . 10\frac{3}{4} \text{ Ans.}$$

$7 . 6$ for 2 months?

$As 7s. 6d.$ is $\frac{3}{8}$ of a $L.$ $\frac{3}{8}$ of $1d.$ are allowed for it.

What is the interest of $L.147 . 12 . 6$ for 9 months?

$$12s. 3\frac{5}{8}d. \text{ for 1 month.}$$

$$L5 . 10 . 8\frac{5}{8} \text{ Ans.}$$

$12s. 6d.$ being $\frac{5}{8}$ of a pound, $\frac{5}{8}$ of a penny are allowed for it.

What is the interest of $L.1002 . 17 . 6$ for 11 months?

$$L.4 . 3 . 6\frac{7}{8} \text{ for 1 month.}$$

$$L.45.19.3\frac{5}{8} \text{ Ans.}$$

$17s. 6d.$ being $\frac{7}{8}$ of a $L.$ $\frac{7}{8}$ of $1d.$ are allowed for it.

$\frac{7}{8}$ are multiplied like farthings or other Fractions, saying 11 times 7 are 77, and 8 into 77 goes 9 times (which is 9 pence) and leaves 5 which is $\frac{5}{8}$ of a penny.

Calculations in Interest can be brought sufficiently near for business by taking the nearest aliquot parts of a pound, that the shillings and pence in the question are of a pound, but if found necessary to bring the solutions to the greatest nicety, do them by the first Rule, considering the pounds as pence, and the pence in the shillings and pence as so many 240ths. as by the following

EXAMPLES.

WHAT is the interest of $L.68 . 7 . 11$ for 8 months?

$$L.68 . 7 . 11$$

$$L.527 . 3 . 4 = £2 . 5 . 7 \text{ Ans.}$$

The £547 as pence are equal to £2 . 5 . 7 and the 3s 4d. being the $\frac{1}{6}$ of a pound is to be considered the $\frac{1}{6}$ of a penny, consequently the answer is £2 . 5 . 7 $\frac{1}{6}$, which in business would be considered as £2 . 5 . 7.

Or by Second Rule, 7s. 11d. being a little above 7s. 6d. which is $\frac{3}{8}$ of a pound, consider it the $\frac{3}{8}$ of a penny, thus,

$$\begin{array}{r} 5s. \ 3d\frac{3}{8} \text{ for 1 month.} \\ \underline{\hspace{1.5cm}} \\ \text{£2 . 5 . 7 } \textit{Ans.} \end{array}$$

What is the interest of £98 . 10 . 6 for 7 months ?

$$\begin{array}{r} \text{£98 . 10 . 6} \\ \underline{\hspace{1.5cm}} \\ 689 . 13 . 6 = \text{£2 . 17 . 5}\frac{1}{2} \textit{Ans.} \end{array}$$

The 689 pence = £2 . 17 . 5 and the 13s. 6d. contain 162 pence, and as there are 240 pence in a pound, the fraction is $\frac{162}{240}$ fully $\frac{2}{3}$, or in business $\frac{1}{2}d$.

As it is generally known that £100 at interest for 12 months at 5 per cent. produces £5 we shall prove the accuracy of the Rule by the following

EXAMPLE.

WHAT is the interest of £100 for 12 months ?

$$\begin{array}{r} \text{£100. for 1 month is 8s. 4d.} \\ \underline{\hspace{1.5cm}} \\ \text{£5 : 0 . 0} \end{array}$$

This sum has been worked on the same principle as the preceding, which clearly proves their accuracy.

Having explained Interest at £5 per cent. for months, we shall now introduce £5 per cent for years.

As the interest of each £1 for a month is 1d. the interest of £1 for a year will consequently be 1s.

Therefore multiply the principal by the years, and the product in pounds, taken as shillings, will be the answer, taking care to allow for the shillings and pence over such part of a shilling as they are of a pound.

Or, the interest of each pound for a year at £5 per cent. is 1s. and so in proportion for any part of a pound.

EXAMPLES.

WHAT is the interest of £30 for 3 years at £5 per cent ?

£30

3

—

90 as shillings = £4 . 10 *Ans.*

Or, £30 for 1 year = £1 . 10

multiply by 3 years.

—
£4 . 10 *Ans.*

What is the interest of £45 for 6 years at £5 per cent ?

£2 . 5 for 1 year.

6

—
£13 . 10 *Ans.*

What is the interest of £126 for $3\frac{1}{2}$ years ?

£6 . 6 for 1 year.

$3\frac{1}{2}$

—
£22 . 1 *Ans.*

£3 . 3 to bring in.

£126 for 1 year being £6 . 6 it is multiplied by $3\frac{1}{2}$, the time for which the interest is required.

What is the interest of £90 for 4 years and three months ?

£4 . 10 for 1 year.

$4\frac{1}{4}$

—
£19 . 2 . 6 *Ans.*

What is the interest of £128 for 5 years and 9 months ?

£6 . 8 for 1 year.

$5\frac{3}{4}$

—
£36 . 16 *Ans.*

What is the interest of £150 . 10 for 7 years ?

£7 . 10 . 6 for 1 year.

7

—
£52 . 13 . 6 *Ans.*

10s. being $\frac{1}{2}$ of a £ and the interest of £1 for a year being a shilling, 6d. is allowed for the interest of 10s. for a year.

What is the interest of $L. 128 . 16 . 8$ for 1 year and 3 months ?

$$1 \text{ yr. } 3 \text{ m.} = 1s. 3d. \text{ of a } L. \text{ is } \frac{1}{16}) 128 . 16 . 8$$

$$L. 8 . 1 . 0\frac{1}{2} \text{ Ans.}$$

What is the interest of $L. 750 . 15 . 7\frac{1}{2}$. for 1 year and 4 months ?

$$1 \text{ yr. } 4 \text{ m.} = 1s. 4d. \text{ of a } L. \text{ is } \frac{1}{15}) 750 . 15 . 7\frac{1}{2}$$

$$L. 50 . 1 . 0\frac{1}{2} \text{ Ans.}$$

What is the interest of $L. 999 . 15 . 6$ for 1 year and 8 months ?

$$1 \text{ yr. } 8 \text{ m.} = 1s. 8d. \text{ is of a } L. \frac{1}{12}) 999 . 15 . 6$$

$$£ 83 . 6 . 3\frac{1}{2} \text{ Ans.}$$

What is the interest of $L. 1795 . 12 . 6$ for 6 years and 8 months ?

$$6 \text{ yrs. } 8 \text{ m.} = 6s. 8d. \text{ of a } £ \text{ is } \frac{1}{3}) 1795 . 12 . 6$$

$$£ 598 . 10 . 10 \text{ Ans.}$$

What is the interest of $L. 1840 . 12$ for 7 years and 6 months ?

$$5 \text{ yrs. at } 5s. \text{ is } \frac{1}{4}) 1840 . 12$$

2 yrs. 6 m. as 2s. 6d. is $\frac{1}{2}$)	460 . 3	for	yrs. m.
	230 . 1 . 6	for	5 0
	<hr style="width: 50%; margin-left: auto; margin-right: auto;"/>		<hr style="width: 50%; margin-left: auto; margin-right: auto;"/>
	L. 690 . 4 . 6	for	7 6
	<hr style="width: 50%; margin-left: auto; margin-right: auto;"/>		<hr style="width: 50%; margin-left: auto; margin-right: auto;"/>

DEMONSTRATION,

Of Interest for Years and Months at £5 per cent.

By the above examples it is evident that calculations of this description can be extended to any amount, and for any length of time ; the accuracy of the Rule is clearly evinced by the circumstance of any sum being left at Simple Interest for 20 years, in which time the interest becomes as much as the principal ; therefore by taking such part of the principal as the time is of 20 years, will give the Answer with the greatest degree of ease and accuracy.

£6 PER CENT.

As £6 per cent. is a most useful rate, being the legal Interest in Ireland, Scotland, and other countries, we here introduce the shortest and most admired Rule for that rate per cent. that has ever been discovered, and is not only valuable as a Rule for 6 per cent., but facilitates the mode of calculating various other rates.

RULE.—Multiply the principal by the number of months, and the product in pounds, taken as shillings, after cutting off the unit figure, which is to be considered as pence, and as many fifths will be the Answer.

For 5s. add $\frac{1}{4}d.$ For 15s. add $\frac{3}{4}d.$
 For 10s. add $\frac{1}{2}d.$ For 16s. 8d. and above add 1d.

DEMONSTRATION OF £6 PER CENT.

£	}	£	{	£
If 100		} give 6		1
in 12 mo.				1 mo.
1200				1
				6
				6£
				240d. in a £
		1200)	1440	($1\frac{1}{3}d.$
			1200	
		240	{	$\frac{240}{1200}$
			}	$\frac{1}{5}$
			

This is proved by the Double Rule of Three, as in the case of 5 per cent. But persons not acquainted with this demonstration, can satisfy themselves by adding $\frac{1}{5}$ th to the interest at 5 per cent. (which is the difference) and it will give one penny and the fifth of the same. But to return, if the interest of each pound for a month is $1\frac{1}{3}d.$ any principal, multiplied by what months soever, will be $1\frac{1}{3}d.$; the operation of reducing them to pounds, shillings and pence, is performed by dividing the product of the multiple by 200, which is done by cutting off the unit figure, which divides it by ten, and then considering the figures left as shillings, and reducing them to pounds and shillings, divides

again by 20, and dividing by both of which is equal to dividing by 200 in the first instance. The cause of dividing by 200 is, that 200 $1\frac{1}{2}d.$ are equal to a pound; it will be seen by the Rule that a proportionate allowance is made for any shillings and pence that may be produced, by multiplying together the principal and months.

The Authors are particularly anxious that those who possess their work, should make themselves well acquainted with 5 and 6 per cent., so as to perform the operations with facility, as by obtaining that advantage they can with little trouble, ascertain the interest of any sum for any length of time, and at any rate per cent.; all the other rates being founded on 5 and 6 per cent.; knowing how very important they are, more examples and explanations, &c. have been given on each of the foregoing methods than on any of the following, and which they trust will be allowed to be extremely simplified, and rendered perfectly easy of acquirement.

EXAMPLES.

WHAT is the interest of £30 for 3 months at £6 per cent.

$$\begin{array}{r} 30 \\ \times 3 \\ \hline 90 \end{array} = 9s. 0d. \text{ Ans.}$$

Here the principal, £30, is multiplied by 3, which produces £90 of which the unit figure is cut off, leaving 9s. which is the Answer, the unit figure to be reckoned as pence.

What is the interest of £40 for 9 months at £6 per cent ?

$$\begin{array}{r} 40 \\ \times 9 \\ \hline 360 \end{array} = £1. 16 \text{ Ans.}$$

What is the interest of £50 for 7 months ?

$$\begin{array}{r} 50 \\ \times 7 \\ \hline 350 \end{array} = £1. 15 \text{ Ans.}$$

What is the interest of £70 for 8 months ?

$$\begin{array}{r} 70 \\ \times 8 \\ \hline 560 \end{array} = £2. 16 \text{ Ans.}$$

What is the interest of £95 for 8 months?

$$\begin{array}{r} \text{£}95 \\ 8 \\ \hline \end{array}$$

$$76|0 = \text{£}3.16. \text{ Ans.}$$

What is the interest of £73 for 7 months?

$$\begin{array}{r} \text{£}73 \\ 7 \\ \hline \end{array}$$

$$51|1 = \text{£}2.11.1\frac{1}{2}. \text{ Ans.}$$

Here the unit figure cut off is by the Rule considered as $1\frac{1}{2}d.$ which with 51s. give the Answer $\text{£}2.11.1\frac{1}{2}.$

What is the interest of £87 for 6 months?

$$\begin{array}{r} \text{£}87 \\ 6 \\ \hline \end{array}$$

$$52|2 = \text{£}2.12.2\frac{2}{3}. \text{ Ans.}$$

What is the interest of £97 for 9 months?

$$\begin{array}{r} \text{£}97 \\ 9 \\ \hline \end{array}$$

$$87|3 = \text{£}4.7.9\frac{3}{4}. \text{ Ans.}$$

What is the interest of £108 for 8 months?

$$\begin{array}{r} \text{£}108 \\ 8 \\ \hline \end{array}$$

$$86|4 = \text{£}4.6.4\frac{4}{5}. \text{ Ans.}$$

Find the interest of £125 for 9 months.

$$\begin{array}{r} \text{£}125 \\ 9 \\ \hline \end{array}$$

$$112|5 = \text{£}5.12.6. \text{ Ans.}$$

Here the unit figure cut off is 5, which is to be considered as $5\frac{1}{2}d.$ and as $\frac{1}{2}$ are equal to $1d.$ the pence are 6, which with 112s. give $\text{£}5.12.6.$

What is the interest of £137 for 8 months?

$$\begin{array}{r} \text{£}137 \\ 8 \\ \hline \end{array}$$

$$109|6 = \text{£}5.9.7\frac{1}{2}. \text{ Ans.}$$

In this question the figure cut off is 6, which is $6\frac{3}{4}d.$ and as 5 fifths are $1d.$ 6 fifths are $1\frac{1}{2}d.$ with the $6d.$ is $7\frac{1}{2}d.$ and 109s. added give $\text{£}5.9.7\frac{1}{2}.$

Find the interest of £146 . 6 . 8 for 9 months.

$$\begin{array}{r} \text{£}146.6.8 \\ 9 \\ \hline \end{array}$$

$$131|7.0.0 = \text{£}6.11.8\frac{2}{3}. \text{ Ans.}$$

There is 6s. 8d. in this question, which by adhering to the Rule must be multiplied, and the unit figure of the pounds cut off, which is $7\frac{7}{8}$ or $8\frac{3}{4}$.

What is the interest of £148.10 for 8 months?

$$\begin{array}{r} \text{£}148.10 \\ 8 \\ \hline \end{array}$$

$$118|8.0 = \text{£}5.18.9\frac{3}{4}. \text{ Ans.}$$

What is the interest of £207.13.4 for 9 months?

$$\begin{array}{r} \text{£}207.13.4 \\ 9 \\ \hline \end{array}$$

$$186|9.0.0 = \text{£}9.6.10\frac{1}{2}. \text{ Ans.}$$

The highest unit figure has now been arrived at, which is 9, that is 9d. and 9 fifths equal to $1\frac{1}{2}$ d. give $10\frac{1}{2}$ d.

What is the interest of £125.10 for 11 months?

$$\begin{array}{r} \text{£}125.10 \\ 11 \\ \hline \end{array}$$

$$138|0.10 = \text{£}6.18.0\frac{1}{2}. \text{ Ans.}$$

After multiplying the principal by 11 there are 10s. for which $\frac{1}{2}$ d. is allowed, which is sufficiently near for business, though in reality it may be reckoned as $\frac{1}{2}$.

What is the interest of £285.8.9 for 12 months?

$$\begin{array}{r} \text{£}285.8.9 \\ 12 \\ \hline \end{array}$$

$$342|5.5.0 = \text{£}17.2.6\frac{1}{4}. \text{ Ans.}$$

What is the interest of £290.1.3 for 12 months?

$$\begin{array}{r} \text{£}290.1.3 \\ 12 \\ \hline \end{array}$$

$$348|0.15 = \text{£}17.8.0\frac{3}{4}. \text{ Ans.}$$

The 348 are shillings, the cipher cut off is pence, and for the 15 shillings $\frac{3}{4}$ d. have been allowed, making the Answer $\text{£}17.8.0\frac{3}{4}$.

What is the interest of £357.4.2 for 4 months?

$$\begin{array}{r} \text{£}357.4.2 \\ 4 \\ \hline \end{array}$$

$$142|8.16.8 = \text{£}7.2.10\frac{3}{4}. \text{ Ans.}$$

The 8 cut off is $8\frac{3}{4}$ or $9\frac{3}{4}$ with a penny allowed for the 16s. 8d. gives $10\frac{3}{4}$.

What is the interest of £365 . 8 . 10 for 13 months?

$$\begin{array}{r} \text{£}365 . 8 . 10 \\ 13 \\ \hline \end{array}$$

$$475|0 . 14 . 10 = \text{£}23 . 15 . 0\frac{3}{4}. \quad \text{Ans.}$$

As any thing above 12s. 6d is $\frac{3}{4}d$. there need be no hesitation in allowing $\frac{3}{4}d$. in this instance, although to simplify the method the Rule directs for 15s. add $\frac{3}{4}d$.

What is the interest of £825 . 9 . 2 for 14 months?

$$\begin{array}{r} \text{£}825 . 9 . 2 \\ 14 \\ \hline \end{array}$$

$$1155|6 . 8 . 4 = \text{£}57 . 15 . 7\frac{1}{2}. \quad \text{Ans.}$$

Here the 6 cut off is 7 $\frac{1}{2}$, and the 8s. 4d. is a half-penny, but as it is not $\frac{3}{4}d$. put down a half-penny.

Interest for years and months may be done in the same manner by reducing both into months, by the following

EXAMPLES.

WHAT is the interest of £70 for 1 year and 8 months?

$$\text{£}70$$

$$20 \text{ months} = 1 \text{ yr. } 8 \text{ m.}$$

$$\begin{array}{r} 140|0 = \text{£}7. \quad \text{Ans.} \end{array}$$

What is the interest of £85 for 2 years and 6 months?

$$\text{£}85$$

$$30 = 2 \text{ yrs. } 6 \text{ m.}$$

$$\begin{array}{r} 255|0 = \text{£}12 . 15. \quad \text{Ans.} \end{array}$$

What is the interest of £30 for 3 years and 4 months?

$$\text{£}30$$

$$40 \text{ months.}$$

$$\begin{array}{r} 120|0 = \text{£}6. \quad \text{Ans.} \end{array}$$

What is the interest of £147 for 4 years and 2 months?

$$\text{£}147$$

$$50 \text{ months.}$$

$$\begin{array}{r} 735|0 = \text{£}36 . 15. \quad \text{Ans.} \end{array}$$

What is the interest of £289 for 10 years?

$$\text{£}289$$

$$120 \text{ months.}$$

$$\begin{array}{r} 3468|0 = \text{£}173 . 8. \quad \text{Ans.} \end{array}$$

What is the interest of £165 for 5 years and 5 months?

$$\begin{array}{r} \text{£}165 \\ 65 \\ \hline 825 \\ 990 \\ \hline \end{array}$$

$$1072|5 = \text{£}53.12.6. \text{ Ans.}$$

What is the interest of £187 for 8 years and 6 months?

$$\begin{array}{r} \text{£}187 \\ 102 \\ \hline \end{array}$$

$$1907|4 = \text{£}95.7.4\frac{1}{2}. \text{ Ans.}$$

Having given various examples at 6 per cent. which are not only simple and accurate in the extreme, but being so easy of division, can be made applicable to numerous other rates of Interest. We shall now give a Rule for $4\frac{1}{2}$ per cent.

RULE.—Calculate at 6 per cent. and deduct a quarter from that amount.

Or, multiply the principal by three quarters of the time, and proceed as in 6 per cent. when the months are even.

EXAMPLES.

WHAT is the interest of £30 for 3 months at $4\frac{1}{2}$ per cent.

$$\begin{array}{r} \text{£}30 \\ 3 \\ \hline 4) \\ 9|0 = 9s. 0d. \text{ at } 6 \text{ per cent.} \\ 2.3 \\ \hline \end{array}$$

$$s.6.9d \text{ at } 4\frac{1}{2} \text{ per cent. } \text{ Ans.}$$

Here we proceed as at 6 per cent. and having found the amount take off $\frac{1}{4}$, leaving $\frac{3}{4}$ of 6, which is $4\frac{1}{2}$, the answer.

What is the interest of £145 for 5 months?

$$\begin{array}{r} \text{£}145 \\ 5 \\ \hline 4) \\ 72|5 = \text{£}3.12.6 \text{ at } 6 \text{ per cent.} \\ 18.1\frac{1}{2} \text{ deduct.} \\ \hline \end{array}$$

$$\text{£}2.14.4\frac{1}{2} \text{ Ans.}$$

What is the interest of $L.150 \cdot 10 \cdot 6$ for 7 months ?

$$\begin{array}{r} L.150 \cdot 10 \cdot 6 \\ \underline{\hspace{1.5cm}} \\ 105 \overline{) 3 \cdot 13 \cdot 6} = L.5 \cdot 5 \cdot 4\frac{1}{4} \text{ at 6 per cent.} \\ \hspace{1.5cm} 1 \cdot 6 \cdot 4 \text{ deduct} \\ \hline L.3 \cdot 19 \cdot 0\frac{1}{4} \text{ Ans.} \end{array}$$

Find the interest of $L.347 \cdot 18 \cdot 10$ for 7 months ?

$$\begin{array}{r} L.347 \cdot 18 \cdot 10 \\ \underline{\hspace{1.5cm}} \\ 243 \overline{) 5 \cdot 11 \cdot 10} = L.12 \cdot 3 \cdot 6\frac{1}{2} \text{ at 6 per cent.} \\ \hspace{1.5cm} 3 \cdot 0 \cdot 10\frac{1}{2} \text{ deduct} \\ \hline L.9 \cdot 2 \cdot 8 \text{ Ans.} \end{array}$$

11s. 10d. not being $\frac{3}{4}d.$ allow $\frac{1}{2}d.$ for it.

What is the interest of $L.420 \cdot 11 \cdot 7$ for 11 months ?

$$\begin{array}{r} L.420 \cdot 11 \cdot 7 \\ \underline{\hspace{1.5cm}} \\ 462 \overline{) 6 \cdot 7 \cdot 5} = L.23 \cdot 2 \cdot 7\frac{1}{2} \text{ at 6 per cent.} \\ \hspace{1.5cm} 5 \cdot 15 \cdot 7\frac{3}{4} \text{ deduct} \\ \hline L.17 \cdot 6 \cdot 11\frac{3}{4} \text{ Ans.} \end{array}$$

What is the interest of $L.100$ for 12 months ?

$$\begin{array}{r} L.100 \\ \underline{\hspace{1.5cm}} \\ 120 \overline{) 0} = L.6 \end{array} \quad \begin{array}{l} \frac{1}{4} \text{ of } L.6 \text{ at 6 per cent.} \\ 1 \cdot 10 \cdot 0 \\ \hline L.4 \cdot 10 \cdot 0 \text{ Proof.} \end{array}$$

Calculations of Interest at $4\frac{1}{2}$ per cent. may be materially shortened, when three quarters of the time can be taken, as the following

EXAMPLES:

WHAT is the interest of $L.185 \cdot 5$ for 4 months at $4\frac{1}{2}$ per cent ?

$$\begin{array}{r} L.185 \cdot 5 \\ \underline{\hspace{1.5cm}} \\ 3 = \text{to } \frac{3}{4} \text{ of 4 months.} \end{array}$$

$$55 \overline{) 5 \cdot 15} = L.2 \cdot 15 \cdot 6\frac{3}{4} \text{ Ans.}$$

What is the interest of $L.225 \cdot 8 \cdot 10\frac{1}{2}$ for 8 months.

$$\begin{array}{r} L.225 \cdot 8 \cdot 10\frac{1}{2} \\ \underline{\hspace{1.5cm}} \\ 6 = \text{to } \frac{3}{4} \text{ of 8 months.} \end{array}$$

$$135 \overline{) 2 \cdot 13 \cdot 3} = L.6 \cdot 15 \cdot 3 \text{ Ans.}$$

In this instance the $2\frac{2}{3}$ and the allowance made for the 13s. 3d. give fully 3 pence.

What is the interest of $L.228 . 17 . 8\frac{1}{4}$ for 1 yr. 4 mo.

$$\begin{array}{r} L.228 . 17 . 8\frac{1}{4} \\ \underline{\hspace{1.5cm}} \\ 12 = \frac{3}{4} \text{ of 16 months.} \end{array}$$

$$274|6 . 12 . 3 = L.13 . 14 . 7\frac{3}{4} \text{ Ans.}$$

What is the interest of $L.380 . 1 . 4$ for 1 year and 8 months?

$$\begin{array}{r} L.380 . 1 . 4 \\ \underline{\hspace{1.5cm}} \\ 15 = \frac{3}{4} \text{ of 20 months.} \end{array}$$

$$570|1 . 0 . 0 = L.28 . 10 . 1\frac{1}{2} \text{ Ans.}$$

What is the interest of $L.100$ for 12 months?

$$\begin{array}{r} L.100 \\ \underline{\hspace{1.5cm}} \\ 9 = \frac{3}{4} \text{ of 12 months.} \end{array}$$

$$90|0 = L.4 . 10 \text{ Ans. and Proof.}$$

RULE for Interest at 4 per cent.—Calculate at 6 per cent. and deduct $\frac{1}{3}$ from that amount.

Or, by taking $\frac{1}{3}$ from the number of months, and multiplying the principal by the remaining months, it then becomes 4 per cent. without the trouble of going into 6 per cent.

EXAMPLES.

WHAT is the interest of $L.55 . 3$ for 5 months?

$$\begin{array}{r} L.55 . 3 \\ \underline{\hspace{1.5cm}} \\ 5 \\ \underline{\hspace{1.5cm}} \\ 3) \\ 27|5 . 15 = L.1 . 7 . 6\frac{3}{4} \text{ at 6 per cent.} \\ \quad \quad \quad 9 . 2\frac{1}{4} \text{ deduct.} \end{array}$$

$$s.18 . 4\frac{1}{2} \text{ at 4 per cent. Ans.}$$

What is the interest of $L.126 . 10$ for 7 months?

$$\begin{array}{r} L.126 . 10 \\ \underline{\hspace{1.5cm}} \\ 7 \\ \underline{\hspace{1.5cm}} \\ 88|5 . 10 = L.4 . 8 . 6\frac{1}{2} \text{ at 6 per cent.} \\ \quad \quad \quad \text{deduct } \frac{1}{3} \quad 1 . 9 . 6 \end{array}$$

$$L.2.19 . 0\frac{1}{2} \text{ nearly. Ans.}$$

What is the interest of $L.158 . 2 . 8\frac{1}{4}$ for 11 months ?

$$L.158 . 2 . 8\frac{1}{4}$$

$$1739 . 9 . 6\frac{3}{4} = L.8 . 13 . 11\frac{1}{4}$$

$$\text{deduct } \frac{1}{3} \quad 2 . 17 . 11\frac{3}{4}$$

$$L.5 . 15 . 11\frac{1}{2} \quad \text{Ans.}$$

The following will be much shortened by multiplying by $\frac{2}{3}$ of the time.

What is the interest of $L.286 . 9 . 2$ for 3 months at 4 per cent ?

$$L.286 . 9 . 2$$

$$2 = \frac{2}{3} \text{ of 3 months.}$$

$$57|2 . 18 . 4 = L.2 . 17 . 3\frac{1}{2} \quad \text{Ans.}$$

What is the interest of $L.320 . 17 . 6$ for 6 months ?

$$L.320 . 17 . 6$$

$$4 = \frac{2}{3} \text{ of 6 months.}$$

$$128|3 . 10 . 0 = L.6 . 8 . 4\frac{1}{2} \quad \text{Ans.}$$

What is the interest of $L.427 . 18 . 9\frac{1}{4}$ for 9 months ?

$$L.427 . 18 . 9\frac{1}{4}$$

$$6 = \frac{2}{3} \text{ of 9 months.}$$

$$256|7 . 12 . 7\frac{1}{2} = L.12 . 16 . 9 \quad \text{Ans.}$$

What is the interest of $L.583 . 0 . 8$ for 15 months ?

$$L.583 . 0 . 8$$

$$10 = \frac{2}{3} \text{ of 15 months.}$$

$$583|0 . 6 . 8 = L.29 . 3 . 0\frac{1}{4} \text{ or } \frac{1}{2} \quad \text{Ans.}$$

What is the interest of $L.580 . 19 . 8\frac{3}{4}$ for 1 year 6 months ?

$$L.580 . 19 . 8\frac{3}{4}$$

$$12 = \frac{2}{3} \text{ of 18 months.}$$

$$697|1 . 16 . 9 = L.34 . 17 . 2\frac{1}{4} \quad \text{Ans.}$$

What is the interest of $L.100$ for 12 months ?

$$L.100$$

$$8 = \frac{2}{3} \text{ of 12 months.}$$

$$80|0 = L.4 \quad \text{Ans.}$$

RULE for Interest at $3\frac{1}{2}$ per cent.—Calculate at 6 per cent. and take half the amount when it becomes 3 per cent. to which amount add $\frac{1}{6}$. Or, by multiplying by half the number of months, it saves the trouble of going into 6 per cent.

EXAMPLES.

WHAT is the interest of £30 for 4 months ?

$$\begin{array}{r} \text{£}30 \\ \quad 2 \quad \frac{1}{2} \text{ of } 4 \text{ is } 2 \text{ months.} \\ \text{add } \frac{1}{6})6|0 \quad \text{at } 3 \text{ per cent.} \\ \quad 1 \cdot 0 \\ \hline \text{s. } 7 \cdot 0 \quad \text{at } 3\frac{1}{2} \text{ per cent.} \end{array}$$

What is the interest of £45 for 6 months ?

$$\begin{array}{r} \text{£}45 \\ \quad 3 \\ \hline \quad 6) \\ 13|5 = 13\text{s. } 6\text{d.} \quad \text{at } 3 \text{ per cent.} \\ \quad 2 \cdot 3 \\ \hline \quad \text{s. } 15 \cdot 9 \quad \text{at } 3\frac{1}{2} \text{ per cent.} \end{array}$$

What is the interest of £85 for 8 months ?

$$\begin{array}{r} \text{£}85 \\ \quad 4 \quad \frac{1}{2} \text{ of } 8 \text{ is } 4 \text{ months.} \\ \hline 6)34|0 \quad \text{at } 3 \text{ per cent.} \\ \quad 5 \cdot 8 \\ \hline \text{£ } 1 \cdot 19 \cdot 8 \quad \text{at } 3\frac{1}{2} \text{ per cent.} \quad \text{Ans.} \end{array}$$

What is the interest of £90 for 7 months ?

$$\begin{array}{r} \text{£}90 \\ \quad 7 \\ \hline \frac{1}{2})63|0 \quad \text{at } 6 \text{ per cent.} \\ \hline \frac{1}{6})31 \cdot 6 \quad \text{at } 3 \text{ per cent.} \\ \quad 5 \cdot 3 \\ \hline \end{array}$$

What is the interest of £125 for 10 months ?

$$\begin{array}{r} \text{£}125 \quad \frac{1}{2} \text{ of } 10 \text{ months is } 5 \text{ months.} \\ \quad 5 \\ \hline \quad 6)2|5 = \text{£}3 \cdot 2 \cdot 6 \quad \text{at } 3 \text{ per cent.} \\ \quad 10 \cdot 5 \\ \hline \text{£}3 \cdot 12 \cdot 11 \quad \text{Ans.} \end{array}$$

What is the interest of £475 for 1 year and 8 months ?

$$\begin{array}{r} \text{£}475 \\ 10 \quad \frac{1}{2} \text{ of } 20 \text{ is } 10 \text{ months.} \\ \hline 6)475|0 \quad \text{at } 3 \text{ per cent.} \\ 79 \cdot 2 \end{array}$$

$$554 \cdot 2 = \text{£}27 \cdot 14 \cdot 2 \text{ at } 3\frac{1}{2} \text{ per cent. } \textit{Ans.}$$

What is the interest of £100 for 12 months at $3\frac{1}{2}$ per cent ?

$$\begin{array}{r} \text{£}100 \\ 6 \quad \frac{1}{2} \text{ of } 12 \text{ is } 6 \text{ months.} \\ \hline 6)60|0 \quad \text{Proof of } 3\frac{1}{2} \text{ per cent being} \\ 10 \cdot 0 \quad \text{perfectly accurate.} \\ \hline \end{array}$$

$$s.70 \cdot 0 = \text{£}3 \cdot 10$$

RULE for interest at 3 per cent.—Three per cent. being the half of 6 per cent. calculate at 6 per cent. and take half the amount.

Or, when the months are even, multiply the principal by half the months, which saves the trouble of going into 6 per cent.

EXAMPLES.

WHAT is the interest of £40 for 2 months ?

$$\begin{array}{r} \text{L.}40 \\ 1 \quad \text{being } \frac{1}{2} \text{ of } 2 \text{ months.} \\ \hline s.4|0 \quad \textit{Ans.} \end{array}$$

What is the interest of L.45.10 for 4 months ?

$$\begin{array}{r} \text{L.}45 \cdot 10 \\ 2 \quad \text{the } \frac{1}{2} \text{ of } 4 \text{ months.} \\ \hline s.9|1\frac{1}{2}d. \quad \textit{Ans.} \end{array}$$

What is the interest of L.55.10 for 8 months ?

$$\begin{array}{r} \text{L.}55 \cdot 10 \\ 4 \quad \text{the } \frac{1}{2} \text{ of } 8 \text{ months.} \\ \hline 22|2\frac{2}{3} = \text{L.}1 \cdot 2 \cdot 2\frac{2}{3}. \quad \textit{Ans.} \end{array}$$

What is the interest of L.91.10 for 10 months ?

$$\begin{array}{r} \text{L.}91 \cdot 10 \\ 5 \quad \text{the } \frac{1}{2} \text{ of } 10 \text{ months.} \\ \hline 45|7 \cdot 10 = \text{L.}2 \cdot 5 \cdot 9. \quad \textit{Ans.} \end{array}$$

What is the interest of £125.10 for 12 months?

$$\begin{array}{r} \text{£}125.10 \\ 6 \text{ the } \frac{1}{2} \text{ of 12 months.} \\ \hline 75 \overline{) 33} = \text{£}3.15.3\frac{1}{2}. \text{ Ans.} \end{array}$$

What is the interest of £130 for 7 months?

$$\begin{array}{r} \text{£}130 \\ 7 \\ \hline 2)91 \overline{) 0} \\ \hline 45.6 = \text{£}2.5.6. \text{ Ans.} \end{array}$$

What is the interest of £155.6.8 for 9 months?

$$\begin{array}{r} \text{£}155.6.8 \\ 9 \\ \hline 2)139 \overline{) 8\frac{8}{9} 0} \\ \hline 69.10\frac{4}{9} = \text{£}3.9.10\frac{4}{9}. \text{ Ans.} \end{array}$$

What is the interest of £225 for 5 months?

$$\begin{array}{r} \text{£}225 \\ 5 \\ \hline 112 \overline{) 5} = L.5.12.6 \text{ at 6 per cent.} \\ \hline L.2.16.3 \text{ at 3 per cent.} \end{array}$$

What is the interest of L.395 for 11 months?

$$\begin{array}{r} L.395 \\ 11 \\ \hline 134 \overline{) 5} = L.21.14.6 \text{ at 6 per cent.} \\ \hline L.10.17.3 \text{ at 3 per cent.} \end{array}$$

What is the interest of L.550 for 7 months?

$$\begin{array}{r} L.550 \\ 7 \\ \hline \frac{1}{2})385 \overline{) 0} \\ \hline 192.6 = L.9.12.6. \text{ Ans.} \end{array}$$

What is the interest of L.651.10 for 1 year 2 months?

$$\begin{array}{r} L.651.10 \\ 7 \text{ the } \frac{1}{2} \text{ of 14 months.} \\ \hline 456 \overline{) 0.10} = L.22.16.0\frac{1}{2}. \text{ or } \frac{1}{2}d. \text{ Ans.} \end{array}$$

What is the interest of £650 . 5 for 1 year 6 months?
£650 . 5

9 is $\frac{1}{2}$ of 18 months.

$$\begin{array}{r} \hline 585|2.5 = \text{£}29.5.2\frac{1}{2}. \text{ Ans.} \end{array}$$

What is the interest of £728 . 1 . 6 for 1 year and 8 months?

£728 . 1 . 6

10 is $\frac{1}{2}$ of 20 months.

$$\begin{array}{r} \hline 728|0.15.0 = \text{£}36.8.0\frac{3}{4}. \text{ Ans.} \end{array}$$

What is the interest of £100 for 12 months?

£100

6 is $\frac{1}{2}$ of 12 months.

$$\begin{array}{r} \hline 60|0 = \text{£}3. \text{ Ans.} \end{array}$$

Proof of the accuracy
of the Rule.

RULE for Interest at $3\frac{3}{4}$ per cent.—Calculate at 3 per cent. (see Rule for 3 per cent.) to which add one-fourth of its amount.

EXAMPLES.

WHAT is the interest of £40 for 8 months at $3\frac{3}{4}$ per cent?

£40

4 the $\frac{1}{2}$ of 8 months.

add $\frac{1}{4}$)16|0 at 3 per cent.

4

$$\begin{array}{r} \hline \hline \text{£}1.0.0 \text{ at } 3\frac{3}{4} \text{ per cent. } \text{ Ans.} \end{array}$$

What is the interest of £80 for 6 months?

£80

3 the $\frac{1}{2}$ of 6 months.

add $\frac{1}{4}$)24|0 at 3 per cent.

6

$$\begin{array}{r} \hline \hline 30 = \text{£}1.10 \text{ at } 3\frac{3}{4} \text{ per cent. } \text{ Ans.} \end{array}$$

What is the interest of £98 for 10 months?

£98

5 the $\frac{1}{2}$ of 10 months.

add $\frac{1}{4}$)49|0 at 3 per cent.

12.3

$$\begin{array}{r} \hline \hline 61.3 = \text{£}3.1.3 \text{ at } 3\frac{3}{4} \text{ per cent. } \text{ Ans.} \end{array}$$

What is the interest of $L.206.13.4$ for 9 months?

$$L.206.13.4$$

$$\frac{1}{2})186|0 \quad \text{at 6 per cent.}$$

$$\text{add } \frac{1}{4})93 \quad \text{at 3 per cent.}$$

$$116.3 = L.5.16.3 \quad \text{at } 3\frac{3}{4} \text{ per cent. } \textit{Ans.}$$

What is the interest of $L.345.9.1\frac{1}{4}$ for 11 months?

$$L.345.9.1\frac{1}{4}$$

$$\frac{1}{2})380|0.0.1\frac{3}{4} \quad \text{at 6 per cent.}$$

$$\text{add } \frac{1}{4})190 \quad \text{at 3 per cent.}$$

$$237.6 = L.11.17.6 \quad \text{at } 3\frac{3}{4} \text{ per cent. } \textit{Ans.}$$

What is the interest of $L.405.10$ for 1 year 8 months?

$$L.405.10$$

$$405|5.0 = L.20.5.6 \quad \text{at 3 per cent.}$$

$$L.25.6.10\frac{1}{2} \quad \text{at } 3\frac{3}{4} \text{ per cent. } \textit{Ans.}$$

What is the interest of $L.560$ for 1 yr. and 10 months?

$$L.560$$

11 is $\frac{1}{2}$ of 22 months.

$$\text{add } \frac{1}{4})616|0 \quad \text{at 3 per cent.}$$

$$770 = L.38.10 \quad \textit{Ans.}$$

What is the interest of $L.100$ for 12 months?

$$L.100$$

6 is $\frac{1}{2}$ of 12 months.

$$\text{add } \frac{1}{4})60|0 \quad \text{at 3 per cent.}$$

$$75 = L.3.15. \quad \textit{Proof.}$$

What is the interest of $L. 365.15$ for 1 yr. 3 months ?

$L.1.10.5\frac{3}{4}$ for 1 month at 5 per cent.
 10 the $\frac{2}{3}$ of 15 months.

$L.15.4.9\frac{1}{2}$ *Ans.*

What is the interest of $L. 100$ for 12 months ?

$3s. 4d.$ for 1 month at 5 per cent.
 8 the $\frac{2}{3}$ of 12 months.

$L.3.6.8$ *Proof.*

RULE for Interest at $2\frac{1}{2}$ per cent.—Calculate at 5 per cent. and take half that amount.

Or, multiply the interest for 1 month at 5 per cent. by $\frac{1}{2}$ the months, when found convenient.

EXAMPLES.

WHAT is the interest of $L. 36$ for 3 months ?

$3s.$
 3
 take $\frac{1}{2}$) $9s.$ at 5 per cent.

$4s. 6d.$ at $2\frac{1}{2}$ per cent. *Ans.*

What is the interest of $L. 48$ for 4 months ?

$4s.$ for 1 month at 5 per cent.
 2 the $\frac{1}{2}$ of 4 months.

$8s.$ at $2\frac{1}{2}$ per cent. *Ans.*

What is the interest of $L. 120$ for 7 months ?

$10s.$
 7 or, $10s.$ for 1 month.
 $3\frac{1}{2}$ is $\frac{1}{2}$ of 7 months.
 take $\frac{1}{2}$) $L.3.10$ at 5 per cent. $L.1.15$ *Ans.*

$L.1.15$ at $2\frac{1}{2}$ per cent.

What is the interest of $L. 145.10$ for 8 months ?

$12s. 1\frac{1}{2}d.$ for 1 month at 5 per cent.
 4 the $\frac{1}{2}$ of 8 months.

$L.2.8.6$ at $2\frac{1}{2}$ per cent. *Ans.*

What is the interest of $L. 240$ for 15 months.

$L.1$ for 1 month at 5 per cent.
 $7\frac{1}{2}$ the $\frac{1}{2}$ of 15 months.

$L.7.10$ *Ans.*

What is the interest of $L.490.5$ for 1 yr. and 4 months?

$L.2.0.10\frac{1}{4}$ for 1 month at 5 per cent.
8 the $\frac{1}{2}$ of 16 months.

L.16.6.10 at $2\frac{1}{2}$ per cent. *Ans.*

What is the interest of $L.368.2.6$ for 1 year and 10 months?

$L.1.10.8\frac{1}{8}$ for 1 month at 5 per cent.
11

L.16.17.5 $\frac{3}{8}$ *Ans.*

What is the interest of $L.968.10$ for 2 years 1 month?

$L.4.0.8\frac{1}{2}$
 $12\frac{1}{2}$ the $\frac{1}{2}$ of 25 months.

L.50.8.10 $\frac{1}{4}$ *Ans.*

What is the interest of $L.1000.10$ for 2 yrs. 4 months?

$L.4.3.4\frac{1}{2}$ for 1 month at 5 per cent.
14

L.58.7.3 *Ans.*

What is the interest of $L.100$ for 12 months?

8s. 4d. for 1 month at 5 per cent.
6 the $\frac{1}{2}$ of 12 months.

L.2:10.0 *Proof.*

RULE for interest at 2 per cent.—Calculate at 6 per cent. and take $\frac{1}{3}$, which will be the answer.

Or, multiply the principal by $\frac{1}{3}$ of the months, which saves the trouble of finding the interest at 6 per cent.

EXAMPLES.

WHAT is the interest of $L.50$ for 3 months at 2 per cent.?

$L.50$
1 the $\frac{1}{3}$ of 3 months.

3.5|0 *Ans.*

What is the interest of $L.55$ for 4 months?

$L.55$
4

take $\frac{1}{3}$)22|0 at 6 per cent.

s.7.4 at 2 per cent. *Ans.*

What is the interest of $L.70.10$ for 5 months ?

$$\begin{array}{r} L.70.10 \\ \underline{\quad\quad} \\ 5 \end{array}$$

$$35 \overline{)2.10} = L.1.15.3 \text{ at 6 per cent.}$$

What is the interest of $L.80.15$ for 6 months ?

$$\begin{array}{r} L.80.15 \\ \underline{\quad\quad} \end{array}$$

2 the $\frac{1}{3}$ of 6 months.

$$16 \overline{)1.10} = 16s. 1\frac{3}{4}d. \text{ or } \frac{1}{3}. \text{ Ans.}$$

What is the interest of $L.160.12.6$ for 8 months ?

$$\begin{array}{r} L.160.12.6 \\ \underline{\quad\quad} \\ 8 \end{array}$$

$$128 \overline{)5.0.0} = L.6.8.6 \text{ at 6 per cent.}$$

Ans. $L.2.2.10$ at 2 per cent.

What is the interest of $L.247.10$ for 9 months ?

$$\begin{array}{r} L.247.10 \\ \underline{\quad\quad} \end{array}$$

3 the $\frac{1}{3}$ of 9 months.

$$74 \overline{)2.10} = L.3.14.3 \text{ Ans.}$$

What is the interest of $L.345.1.6$ for 10 months ?

$$\begin{array}{r} L.345.1.6 \\ \underline{\quad\quad} \\ 10 \end{array}$$

$$345 \overline{)0.15.0} = L.17.5.0\frac{3}{4} \text{ at 6 per cent.}$$

$L.5.15.0\frac{1}{4}$ *Ans.*

What is the interest of $L.356.7$ for 1 year 3 months ?

$$\begin{array}{r} L.356.7 \\ \underline{\quad\quad} \end{array}$$

5 the $\frac{1}{3}$ of 15 months.

$$178 \overline{)1.15} = L.8.18.2 \text{ Ans.}$$

What is the interest of $L.425$ for 1 year and 9 months ?

$$\begin{array}{r} L.425 \\ \underline{\quad\quad} \end{array}$$

7 the $\frac{1}{3}$ of 21 months.

$$297 \overline{)5} = L.14.17.6 \text{ Ans.}$$

What is the interest of $L.480.3.4$ for 2 years and months ?

$$\begin{array}{r} L.480.3.4 \\ \underline{\quad\quad} \end{array}$$

9 the $\frac{1}{3}$ of 27 months.

$$432 \overline{)1.10.0} = L.21.12.1\frac{1}{3}. \text{ Ans.}$$

What is the interest of $L.655.12.6$ for 2 years at 2 per cent ?

$$\begin{array}{r} L.655.12.6 \\ \hline 8 \text{ the } \frac{1}{3} \text{ of 24 months.} \end{array}$$

$$524 \overline{)5.0.0} = L.26.4.6. \quad \text{Ans.}$$

What is the interest of $L.100$ for 12 months ?

$$\begin{array}{r} L.100 \\ \hline 4 \text{ the } \frac{1}{3} \text{ of 12 months.} \end{array}$$

$$40 \overline{)0} = L.2 \quad \text{Proof.}$$

RULE for interest at $1\frac{1}{2}$ per cent.—Calculate at 6 per cent., and take $\frac{1}{4}$, which will be the answer.

Or, multiply the principal by $\frac{1}{4}$ of the months (when found convenient) which gives the answer without going into 6 per cent.

EXAMPLES.

WHAT is the interest of $L.30$ for 4 months ?

$$\begin{array}{r} L.30 \\ \hline 1 \text{ the } \frac{1}{4} \text{ of 4 months.} \end{array}$$

$$s.3 \overline{)0} \quad \text{Ans.}$$

What is the interest of $L.50$ for 5 months ?

$$\begin{array}{r} L.50 \\ \hline 5 \end{array}$$

take $\frac{1}{4}$) $25 \overline{)0}$ at 6 per cent.

$$s.6.3 \quad \text{Ans.}$$

What is the interest of $L.70$ for 7 months ?

$$\begin{array}{r} L.70 \\ \hline 7 \end{array}$$

take $\frac{1}{4}$) $49 \overline{)0}$ at 6 per cent.

$$s.12.3 \text{ at } 1\frac{1}{2} \text{ per cent.} \quad \text{Ans.}$$

What is the interest of $L.75.10$ for 8 months ?

$$\begin{array}{r} L.75.10 \\ \hline 2 \text{ the } \frac{1}{4} \text{ of 8 months.} \end{array}$$

$$s.15.1\frac{1}{2} \quad \text{Ans.}$$

What is the interest of $L.125.6.8$ for 9 months ?

$$\begin{array}{r} L.125.6.8 \\ \hline 9 \end{array}$$

$$112 \overline{)8.0.0} = L.5.12.9\frac{3}{4} \text{ at 6 per cent.}$$

$$\frac{1}{4}) \quad \frac{1}{4} \overline{)8.0.0} = L.1.8.2\frac{2}{3} \text{ at } 1\frac{1}{2} \text{ per cent.} \quad \text{Ans.}$$

What is the interest of £165.13.4 for 12 months ?

£165.13.4

3 the $\frac{1}{4}$ of 12 month.

$$\begin{array}{r} \hline 49|7.0.0 = £2.9.3\frac{3}{4}. \text{ Ans.} \end{array}$$

What is the interest of £245.10 for 1 yr. 8 months ?

£245.10

5 the $\frac{1}{4}$ of 20 months.

$$\begin{array}{r} \hline 122|7.10 = £6.2.9. \text{ Ans.} \end{array}$$

What is the interest of £365 for 2 years ?

£365

6 the $\frac{1}{4}$ of 24 months.

$$\begin{array}{r} \hline 219|0 = £10.19. \text{ Ans.} \end{array}$$

What is the interest of £475 for 2 years 4 months ?

£475

7 the $\frac{1}{4}$ of 28 months.

$$\begin{array}{r} \hline 332|5 = £16.12.6. \text{ Ans} \end{array}$$

What is the interest of £575 for 3 years ?

£575

9 the $\frac{1}{4}$ of 36 months.

$$\begin{array}{r} \hline 517|5 = £25.17.6. \text{ Ans.} \end{array}$$

What is the interest of £840.10 for 3 years 4 months ?

£840.10

10 the $\frac{1}{4}$ of 40 months.

$$\begin{array}{r} \hline 840|5.0 = £42.0.6. \text{ Ans.} \end{array}$$

What is the interest of £951 for 3 years 8 months ?

£951

11 the $\frac{1}{4}$ of 44 months.

$$\begin{array}{r} \hline 1046|1 = £52.6.1\frac{1}{5}. \text{ Ans.} \end{array}$$

What is the interest of £100 for 12 months ?

£100

3 the $\frac{1}{4}$ of 12 months.

$$\begin{array}{r} \hline 30|0 = £1.10. \text{ Proof.} \end{array}$$

RULE for Interest at $1\frac{1}{4}$ per cent.—Calculate at 5 per cent. and take $\frac{1}{4}$, or multiply the interest for one month at 5 per cent. by $\frac{1}{4}$ of the months.

WHAT is the interest of £48 for 4 months?
 4s. for 1 month at 5 per cent.
 1 the $\frac{1}{4}$ of 4 months.

4s. *Ans.*

What is the interest of £96 for 5 months?
 8s.
 5

$\frac{1}{4}$)2 . 0 . 0 at 5 $\frac{1}{4}$ per cent.

10s. *Ans.*

What is the interest of £99.15 for 12 months?
 8s. $3\frac{3}{4}$ d. for 1 month at 5 per cent.
 3 the $\frac{1}{4}$ of 12 months.

£1 . 4 . 11 $\frac{1}{4}$. *Ans.*

What is the interest of £144.10 for 11 months?
 12s. 0 $\frac{1}{2}$ d.
 11

take off $\frac{1}{4}$)6 . 12 . 5 $\frac{1}{2}$ at 5 per cent

£1 . 13 . 1 $\frac{3}{8}$ *Ans.*

What is the interest of £199.15 for 1 year 4 months?
 16s. $7\frac{3}{4}$ d. for 1 month at 5 per cent.
 4 the $\frac{1}{4}$ of 16 months.

£3 . 6 . 7 *Ans.*

What is the interest of £240 for 1 year 8 months?
 £1 for 1 month at 5 per cent.
 5 the $\frac{1}{4}$ of 20 months.

£5 *Ans.*

What is the interest of £365 . 2 . 6 for 2 years and 3 months?

£1 . 10 . 5 $\frac{1}{8}$ for 1 month at 5 per cent.
 8 the $\frac{1}{4}$ of 32 months.

£12 . 3 . 5 *Ans.*

What is the interest of £480.15 for 3 years?
 £2 . 0 . 0 $\frac{3}{4}$ for 1 month at 5 per cent.
 9 is $\frac{1}{4}$ of 36 months.

£18 . 0 . 6 $\frac{3}{4}$ *Ans.*

What is the interest of £100 for 12 months?

8s. 4d. for 1 month.
3 the $\frac{1}{4}$ of 12 months.

£1 . 5 . 0 *Ans.*

RULE for Interest, Discount, or Commission at $\frac{1}{2}$ per cent.—Cut off the unit's figure of the £. consider those not cut off as shillings, and the unit's figure cut off consider as pence and as many fifths, for 4 or 5 in the shillings add $\frac{1}{4}d.$ for 8 or 10 add $\frac{1}{2}d.$ for 12 or 14 add $\frac{3}{4}d.$ and for 16s. 8d. and upwards add 1d. which will give the answer required.

DEMONSTRATION.

Half per cent. being the 200th part of the whole amount, the said amount is divided by 200, which is more fully explained in the Demonstration for Interest for 6 per cent. for Months. See Page 47.

EXAMPLES.

WHAT is the commission on £120 at $\frac{1}{2}$ per cent.?

£12|0 = 12s. *Ans.*

Here as by the Rule the unit's figure is cut off, which is a cipher, and is to be considered as pence, and the 12 not cut off is directed to be considered as shillings, which gives 12s.

What is the discount on £321 at $\frac{1}{2}$ per cent.?

£32|1 = £1 . 12 . 1 $\frac{1}{2}$. *Ans.*

Here the figure cut off is 1 $\frac{1}{2}d.$ the 32 not cut off are 32 shillings

What is the interest of £425 at $\frac{1}{2}$ per cent.?

£42|5 = £2 . 2 . 6. *Ans.*

The 5 cut off is 5 $\frac{1}{2}$. equal to 6d. This is of course the interest for 12 months.

What is the commission on £1255 . 5 at $\frac{1}{2}$ per cent.?

£125|5 . 5 = £6 . 5 . 6 $\frac{1}{4}$. *Ans.*

For the 5 shillings, $\frac{1}{4}d.$ is to be allowed, see Rule.

What is the brokerage on £1450 . 12 . 6 at $\frac{1}{2}$ per cent.?

£145|0 . 12 . 6 = £7 . 5 . 0 $\frac{3}{4}$. *Ans.*

What is the discount of £1552 at $\frac{1}{2}$ per cent. ?

$$£155|2 = £7.15 . 2\frac{2}{3} . \text{ or } 2\frac{1}{4}d. \text{ Ans.}$$

Find the commission on £7647 at $\frac{1}{2}$ per cent. ?

$$£764|7 = £38 . 4 . 8\frac{2}{3} . \text{ or } \frac{1}{4}d. \text{ Ans.}$$

The $7\frac{1}{2}d.$ are = to $8\frac{2}{3}d.$ as five-fifths are $1d.$ seven-pence seven-fifths are equal to $8\frac{2}{3}d.$

What is the discount on £8769.16 . 8 at $\frac{1}{2}$ per cent. ?

$$£876|9.16 . 8 = £43.16.11\frac{1}{3} . \text{ or } \frac{3}{4}d. \text{ Ans.}$$

What is the brokerage on £10568 . 4 at $\frac{1}{2}$ per cent. ?

$$£1056|8 . 4 = £52.16 . 9\frac{3}{4} . \text{ Ans.}$$

Commission, Discount, Brokerage, at $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$ per cent. will be found particularly useful to bankers and merchants, as they are allowances made by the one to the other for keeping the accounts, &c.

If it be found necessary to find the Commission, &c. at $\frac{1}{4}$ per cent. take the half of $\frac{1}{2}$ per cent. and if $\frac{1}{8}$ per cent. is wanted, take the $\frac{1}{4}$ of half per cent. Thus:

Find the Commission on £1270.10 at $\frac{1}{4}$ per cent.

$$£127|0.10 = \frac{1}{2}) £21 . 7 . 0\frac{1}{2} \text{ at } \frac{1}{2} \text{ per cent.}$$

$$\underline{\hspace{10em}} \\ £10.13 . 6\frac{1}{4} \text{ at } \frac{1}{4} \text{ per cent. Ans.}$$

Find the discount on £3485.18 . 2 at $\frac{1}{8}$ per cent.

$$£348|5.18 . 2 = \frac{1}{4}) £42 . 8 . 7 \text{ at } \frac{1}{2} \text{ per cent.}$$

$$\underline{\hspace{10em}} \\ £10.12 . 1\frac{3}{4} \text{ at } \frac{1}{8} \text{ per cent. Ans.}$$

Should interest be required at 1 per cent. Double $\frac{1}{2}$ per cent. or take the $\frac{1}{6}$ th of 6 per cent.

As calculations of Interest for days are indispensably necessary to bankers, merchants, traders, &c. and the ordinary plan heretofore introduced being tedious and difficult for making such calculations, we beg leave to introduce the following short and easy method, which has given the greatest possible satisfaction to all persons who have studied it.

RULE for Interest for days at £6 per cent. per annum—Multiply the principal by the days; for each 100 they produce, allow 4 pence, but for each 6 shillings of Interest found out deduct or take off one penny, and so in proportion; the remainder will be the answer.

DEMONSTRATION,

It will be found that the interest of £100 for one day at 6 per cent. will produce $3\frac{36}{100}d.$, which being nearly $4d.$ we consider it as such, and then the deduction of $1d.$ for each $6s.$ corrects the error.

It may also be considered as counting the year as 360 days, instead of 365, consequently the difference must be deducted, namely, the same part of the amount, as the 5 days are of 365 which is $\frac{1}{73}$, or a penny for each $6s.$ will give an answer sufficiently accurate.

Note, Any sums for any number of days, when multiplied together and producing 100, would give the same result, that is. £20 for 5 days, £25 for 4 days, each when multiplied together, would be the same as £100 for 1 day, or £1 for 100 days. Hence the cause of adopting the above method, which has been allowed by the most competent judges to be perfectly accurate, and in a high degree to combine ingenuity and simplicity.

EXAMPLES.

WHAT is the interest of £ 10 for 10 days, at 6 per cent. ?

$$\begin{array}{r} \text{£}10 \\ 10 \\ \hline \end{array}$$

100 = to 4d. *Ans.*

The Answer being only 4d. nothing can be well taken off.

What is the interest of £20 for 20 days, at 6 per cent. ?

$$\begin{array}{r} \text{£}20 \\ 20 \\ \hline \end{array}$$

400 = 1s. 4d.

$0\frac{1}{4}$ deduct.

$s. 1 . 3\frac{3}{4}$ *Ans.*

1s. 4d. being nearly the quarter of 6s. a farthing may be taken off.

What is the interest of £30 for 30 days at 6 per cent.?

$$\begin{array}{r} \text{£}30 \\ 30 \\ \hline 900 = 3s. 0d. \\ \quad 0\frac{1}{2} \text{ deduct for } 3s. \\ \hline s. 2 \cdot 11\frac{1}{2} \text{ Ans.} \end{array}$$

Note, As 100 is 4d. 300 must be 1s. therefore dividing by 300 gives shillings, observing to allow 4d. for every 100 over, after dividing by 300, as the following Examples more clearly explain.

What is the interest of £30 for 30 days ?

$$\begin{array}{r} \text{£}30 \\ 30 \\ \hline 3|00)9|00 \\ \hline \end{array}$$

By cancelling 2 figures at each side, it reduces the operation to simply dividing

s. 3 minus ½d. Ans. 2s. 11½d. by 3.

What is the interest of £40 for 40 days ?

$$\begin{array}{r} \text{£}40 \\ 40 \\ \hline 3|00)16|00 \\ \hline \end{array}$$

*s. 5. 4 minus 1d. 5s. 4d. being nearly 6s.
Ans. 5s. 3d.*

100 over = to 4d.

What is the interest of £45 for 40 days ?

$$\begin{array}{r} \text{£}45 \\ 40 \\ \hline 3|00)18|00 \\ \hline \end{array}$$

s. 6 minus 1d. Ans. 5s. 11d.

What is the interest of £50 for 50 days ?

$$\begin{array}{r} \text{£}50 \\ 50 \\ \hline 3|00)25|00 \\ \hline \end{array}$$

s. 8. 4 minus 1½d. Ans. 8s. 2½d.

100 over, for which allow 4d.

What is the interest of £60 for 60 days ?

$$\begin{array}{r} \text{£}60 \\ 60 \\ \hline 3|00)36|00 \\ \hline \end{array}$$

s. 12. 0 minus 2d. Ans. 11s. 10d.

What is the interest of $L.65$ for 70 days ?

$$\begin{array}{r} L.65 \\ \underline{70} \\ 3|00)45|50- \\ \hline s.15 \cdot 2 \text{ minus } 2\frac{1}{2}d. \quad \text{Ans. } 14s. 11\frac{1}{2}d. \end{array}$$

50 over, for which allow $2d.$

What is the interest of $L.85$ for 80 days ?

$$\begin{array}{r} L.85 \\ \underline{80} \\ 3|00)68|00 \\ \hline s.22 \cdot 8 \text{ minus } 3\frac{3}{4}d. \quad \text{Ans. } L.1 \cdot 2 \cdot 4\frac{1}{4}d. \end{array}$$

What is the interest of $\pounds 95$ for 50 days ?

$$\begin{array}{r} L.95 \\ \underline{50} \\ 3|00)47|50 \\ \hline s.15 \cdot 10 \text{ minus } 2\frac{1}{2}d. \quad \text{Ans. } 15s. 7\frac{1}{2}d. \end{array}$$

250 over at $4d.$ per 100 comes to 10 pence.

What is the interest of $L.125$ for 95 days ?

$$\begin{array}{r} L.125 \\ \underline{95} \\ \quad 625 \\ \underline{1125} \\ 3|00)118|75 \\ \hline s.39 \cdot 7 \text{ minus } 6\frac{1}{2}d. \quad \text{Ans. } \pounds 1 \cdot 19 \cdot 0\frac{1}{2} \end{array}$$

175 over, being $1\frac{3}{4}$ of a 100, allow 7 pence.

What is the interest of $\pounds 155$ for 110 days ?

$$\begin{array}{r} L.155 \\ \underline{110} \\ 3|00)170|50 \\ \hline 56 \cdot 10 \text{ minus } 9\frac{1}{2}d. \quad \text{Ans. } 2 \cdot 16 \cdot 0\frac{1}{2} \end{array}$$

250 over, at $4d.$ a 100, comes to 10 pence.

What is the interest of $\pounds 3405$ for 5 days ?

$$\begin{array}{r} \pounds 3405 \\ \underline{5} \\ 3|00)170|25 \\ \hline 56 \cdot 9 \text{ minus } 9\frac{1}{2}d. \quad \text{Ans. } 2 \cdot 15 \cdot 11\frac{1}{2}. \end{array}$$

225 being $2\frac{1}{4}$ of 100, allow $9d.$

What is the interest of £975 for 130 days ?

$$\begin{array}{r} \text{£}975 \\ 130 \quad \quad 150 \text{ over, allow } 6d. \\ \hline 3 \overline{)00}1267 \overline{)50} \\ \hline \end{array}$$

422. 6 minus 5s. 10d. *Ans. L. 20. 16. 9*

What is the interest of £1245. 10 for 20 days ?

$$\begin{array}{r} \text{£}1245. 10 \\ 20 \quad \quad 10 \text{ over, allow } \frac{1}{2}d \text{ for.} \\ \hline 3 \overline{)00}249 \overline{)10} \\ \hline \end{array}$$

83. 0 $\frac{1}{2}$ minus 1s. 1 $\frac{3}{4}$ d. *Ans. L4. 1. 10 $\frac{3}{4}$.*

What is the interest of £1680. 10 for 30 days ?

$$\begin{array}{r} \text{£}1680. 10 \\ 30 \quad \quad 15 \text{ over, allow } \frac{1}{2}d. \\ \hline 3 \overline{)00}504 \overline{)15} \\ \hline \end{array}$$

168. 0 $\frac{1}{2}$ minus 2s. 3 $\frac{1}{2}$ d. *Ans. £8. 5. 9*

What is the interest of L. 100 for 365 days at 6 per cent. ?

$$\begin{array}{r} 365 \\ 100 \quad \quad 200 \text{ over, allow } 8d. \\ \hline 3 \overline{)00}365 \overline{)00} \\ \hline \end{array}$$

121. 8 minus 1s. 8d. *Proof £6.*

It appears that for 1s. 8d. nothing has been allowed, which could be only $\frac{1}{4}$, but for all transactions in business the above Rule has been considered sufficiently accurate.

Any person desirous of bringing out the exact fraction (which no person in business would deem worth the trouble) by taking a $\frac{1}{72}$ off, instead of $\frac{1}{72}$, which is a penny for every six shillings, will find it calculated to a mathematical nicety.

To calculate Interest at 5 per cent. for days.—Find the interest at 6 per cent. agreeably to the Rule for 6 per cent. and deduct $\frac{1}{6}$ th of that amount.

EXAMPLES:

WHAT is the interest of L.45 for 40 days at 5 per cent ?

$$\begin{array}{r} L.45 \\ 40 \\ \hline 3|00)18|00 \end{array}$$

s.6 minus 1d. $\frac{1}{6}$) 5s. 11d. at 6 per cent.
 $11\frac{3}{4}$ deduct.

Ans. s. 4. 11 $\frac{1}{4}$ at 5 per cent.

What is the interest of £30 for 30 days ?

$$\begin{array}{r} £30 \\ 30 \\ \hline 3|00)9|00 \end{array}$$

3 minus $\frac{1}{2}$ d. $\frac{1}{6}$) 2s. 11 $\frac{1}{2}$ d. at 6 per cent.
 6 nearly.

Ans. s. 2. 5 $\frac{1}{2}$ at 5 per cent.

What is the interest of L.60 for 60 days ?

$$\begin{array}{r} £60 \\ 60 \\ \hline 3|00)36|00 \end{array}$$

s.12 minus 2d. at 6 per cent. 11s. 10d.
 deduct $\frac{1}{6}$ s.1 . 11 $\frac{3}{4}$

s 9 . 10 $\frac{1}{4}$ *Ans.*

What is the interest of £90 for 95 days ?

$$\begin{array}{r} 95 \\ 90 \\ \hline 3|00)85|50 \end{array}$$

28 . 6 minus 4 $\frac{3}{4}$ d. at 6 per cent. £1 . 8 . 1 $\frac{1}{4}$
 deduct $\frac{1}{6}$ 4 . 8 $\frac{1}{4}$

at 5 per cent. £1 . 3 . 5 *Ans.*

The foregoing few examples may be sufficient to shew how 5 per cent. may be done, by taking $\frac{1}{6}$ th from 6 per cent. and by taking $\frac{1}{6}$ th from the Interest, which have been calculated at 6 per cent. gives the respective answers at 5 per cent.

We now introduce calculations for Interest for days at 5 per cent. independent of finding at 6 per cent.

RULE.—Multiply the principal by $\frac{1}{3}$ of the days, or the days by $\frac{1}{3}$ of the principal, cut off the unit figure of the £ from that product, consider those not cut off as pence, deduct 1*d.* for each 6*s.* contained therein, the remainder will be the answer.

DEMONSTRATION.

In the Demonstration of Interest for Months, at 5 per cent. page 39, it was clearly proved that the interest of each £ for a month is one penny, and on that fact is founded this method for Days.

Note, If the principal and days are multiplied together, and the product divided by the number of days in a month, the quotient will doubtless be pence: but as the average month (by dividing 365 by 12 months) will be found to contain $30\frac{5}{12}$ days, (an awkward division) we proceed as if there were but 30 days in the month—consequently, only 360 in the year; and as dividing any sum by 360, instead of 365, would give a greater quotient, the difference must be deducted; so that the quotient will be the same as if it really had been divided by 365, which will be done effectually by taking such part off as the 5 remaining days are of a year, viz. a 73rd.; but 1*d.* for each 6*s.*, or a 72nd., will be found near enough for use.

Now by the following examples the above dividing is materially abridged; for by *multiplying by $\frac{1}{3}$ of the days* it is only necessary to divide by $\frac{1}{3}$ of 30, which is done by cutting off the unit figure of the £*s.* of the product, which, as before laid down, is dividing by 10; and by that means a very tiresome operation is entirely dispensed with, and the interest of any sum, at any rate of interest, discovered by persons totally unacquainted with the rudiments of Arithmetic; and who perhaps, from their habits and constitution, &c. are unqualified for ever acquiring that useful knowledge by the ordinary method.

EXAMPLES.

WHAT is the interest of £20 for 6 days ?

$$\begin{array}{r} L.20 \\ 2 \text{ is } \frac{1}{3} \text{ of } 6. \\ \hline 4|0 = 4d. \quad \text{Ans.} \end{array}$$

Here the $\frac{1}{3}$ of 6 is 2, 20 multiplied by 2 produces 40, the unit figure cut off leaves 4, which is 4*d.*, and as only 1*d.* for 6*s.* is to be deducted, 4*d.* being so trifling a part of 6*s.* we do not take any thing off.

What is the interest of L.40 for 9 days ?

$$\begin{array}{r} L.40 \\ 3 \text{ is } \frac{1}{3} \text{ of } 9 \text{ days.} \\ \hline d. 12|0 \quad \text{Ans. } 1s. \end{array}$$

What is the interest of L.15 for 16 days ?

16 Here $\frac{1}{3}$ of 15 being easier taken than $\frac{1}{3}$ of 16, it
5 is better to multiply 16 by 5.

$$\begin{array}{r} 8|0 = 8d. \quad \text{Ans.} \end{array}$$

What is the interest of L.25 for 24 days ?

$$\begin{array}{r} L.25 \\ 8 = \frac{1}{3} \text{ of } 24 \text{ days.} \\ \hline d.20|0 = 1s. 8d. \text{ minus } \frac{1}{4}d. \quad \text{Ans. } 1s. 7\frac{3}{4}. \end{array}$$

What is the interest of L.60 for 18 days ?

$$\begin{array}{r} L.60 \\ 6 = \frac{1}{3} \text{ of } 18 \text{ days ?} \\ \hline d.36|0 = 3s. \text{ minus } \frac{1}{2}d. \quad \text{Ans. } 2s. 11\frac{1}{2}d. \end{array}$$

What is the interest of L.45 for 40 days ?

$$\begin{array}{r} 40 \\ 15 = \frac{1}{3} \text{ of } 45. \\ \hline d.60|0 = 5s. \text{ minus } 1d. \quad \text{Ans. } 4s. 11d. \end{array}$$

Find the interest of L.30 for 70 days.

$$\begin{array}{r} 70 \\ 10 = \frac{1}{3} \text{ of } 30. \\ \hline d.70|0 = 5s. 10d. \text{ minus } 1d. \quad \text{Ans. } 5s. 9d \end{array}$$

What is the interest of $L.65$ for 60 days ?

$L.65$

$20 = \frac{1}{3}$ of 60 days.

—————

$130|0 = 10s. 10d.$ minus $2d. = 10s. 8d.$ *Ans.*

Note, such part as the figure cut off is of 10, allow such part of a $1d.$

What is the interest of $L.75$ for 33 days ?

$L.75$

$11 = \frac{1}{3}$ of 33 days.

—————

$82|5 = 6s. 10\frac{1}{2}d.$ minus $1d.$ *Ans.* $6s. 9\frac{1}{2}d.$

Here the 5 being $\frac{1}{2}$ of 10, and dividing by 10 allow $\frac{1}{2}d.$

What is the interest of $L.125$ for 36 days ?

$L.125$

$12 = \frac{1}{3}$ of 36 days.

—————

$150|0 = 12s. 6d.$ minus $2d.$ *Ans.* $12s. 4d.$

What is the interest of $L.145$ for 37 days ?

$L.145$

$12\frac{1}{3}$

—————

1740

48

—————

$178|3 = 14s. 10\frac{3}{4}d.$ minus $2\frac{1}{2}d.$ *Ans.* $14s. 8\frac{1}{4}d.$

Here $12\frac{1}{3}$ being $\frac{1}{3}$ of 37, multiply by $12\frac{1}{3}$, and the 8 over being $\frac{3}{4}$ of 10, allow for it $\frac{3}{4}d.$

Find the interest of $L.185$ for 61 days.

$\pounds 185$ 61 to bring in, being the $\frac{1}{3}$ of 185, the fraction over being of no consequence is rejected.

$20\frac{1}{3}$

$376|1 = \pounds 1.11.4$ deduct $5\frac{1}{4}d.$ *Ans.* $\pounds 1.10.10\frac{3}{4}d.$

Here the figure is cut off, being only one and the tenth of a penny, being of no consequence in business, it is rejected.

What is the interest of $\pounds 250$ for 150 days ?

$\pounds 250$

50 is $\frac{1}{3}$ of 150.

—————
 $1250|0 = L.5.4.2$ minus $1s. 5d. = L.5.2.9.$ *Ans.*

Having given sufficient examples, we shall introduce a question to prove the accuracy of the rule.

What is the interest of £240 for 73 days ?

L.240 for 1 year at 5 per cent. is L. 12.0.0

$$73 \text{ days are } \frac{1}{5} \text{ of a year} = 2.3.0 \text{ Ans.}$$

As the interest of L.240 for 1 year is 240s. which is L 12 and 73 days being the $\frac{1}{5}$ of a year, the interest for 73 days must be the $\frac{1}{5}$ of L.12 which is L.2.8.

£73

80 is $\frac{1}{5}$ of £240.

$$\begin{array}{r} 584 \mid 0 = 584d. = £2.8.8 \\ \text{minus } 0.0.8 \\ \hline \end{array}$$

£2.8.0 Proof.

RULE for interest for days at $4\frac{1}{2}$ per cent.—Calculate at 6 per cent. and take $\frac{1}{4}$ from the amount, the same as the Rule given for months at $4\frac{1}{2}$ per cent.

EXAMPLES.

WHAT is the interest of £45 for 40 days.

$$\begin{array}{r} L.45 \\ 40 \\ \hline 3 \mid 00 \overline{) 18 \mid 00} \end{array}$$

6 minus 1d. = $\frac{1}{4}$)s.5.11d. at 6 per cent.
1.5 $\frac{3}{4}$ deduct.

Ans. s.4.5 $\frac{1}{4}$ at $4\frac{1}{2}$ per cent.

What is the interest of L.90 for 90 days ?

$$\begin{array}{r} £90 \\ 90 \\ \hline 3 \mid 00 \overline{) 81 \mid 00} \end{array}$$

27 minus $4\frac{1}{2}d.$ $\frac{1}{4}$) £1.6.7 $\frac{1}{2}$ at 6 per cent.
6.7 $\frac{3}{4}$

at $4\frac{1}{2}$ per cent. s.19.11 $\frac{3}{4}$ Ans.

Either of the above calculations may be shortened by taking $\frac{1}{4}$ either from the amount or the days, like the following:

What is the interest of £120 for 120 days?

$$\begin{array}{r} \text{£}120 \\ \quad 90 \\ \hline 3 \overline{)00}108 \overline{)00} \end{array}$$

*s.*36 minus 6*d.* £1.15.6 at $4\frac{1}{2}$ per cent. *Ans.*

The above examples will be found sufficient at $4\frac{1}{2}$ per cent. for by taking $\frac{1}{4}$ from any of the examples at 6 per cent. you have at once the interest at $4\frac{1}{2}$ per cent.

RULE for interest at 4 per cent.—Calculate by the Rule for 6 per cent. for days, and take $\frac{1}{3}$ from that amount.

EXAMPLES.

What is the interest of £40 for 60 days?

$$\begin{array}{r} \text{£}40 \\ \quad 60 \text{ days.} \\ \hline 3 \overline{)00}24 \overline{)00} \end{array}$$

s. minus $1\frac{1}{2}$ *d.* $s.7.10\frac{1}{2}$ at 6 per cent.
 $\frac{1}{3}$)
 $\underline{2.7\frac{1}{2}}$ deduct.
*s.*5.3 *Ans.*

What is the interest of £50 for 65 days?

$$\begin{array}{r} 65 \text{ days} \\ \quad 50 \\ \hline 3 \overline{)00}32 \overline{)50} \end{array}$$

*s.*10.10*d.* minus $1\frac{3}{4}$ *d.* $s.10.8\frac{1}{4}$ *d.* at 6 per cent.
 $\frac{1}{3}$)
 $\underline{3.6\frac{3}{4}}$ deduct.
Ans. $s.7.1\frac{1}{2}$ at 4 per cent.

What is the interest of £75 for 70 days?

$$\begin{array}{r} \text{£}75 \\ \quad 70 \text{ days.} \\ \hline 3 \overline{)00}52 \overline{)50} \end{array}$$

*s.*17.6 minus 3*d.* $s.17.3$ at 6 per cent.
 $\frac{1}{3}$)
 $\underline{5.9}$
*s.*11.6 *Ans.*

above calculations may be shortened, by either
 \ off the amount, or off the number of days, like
 wing

EXAMPLE.

WHAT is the interest of £90 for 90 days?

L.90 deduct $\frac{1}{3}$ of 90, leaves 60.

60 days.

$$\begin{array}{r} 3 \overline{)00}54 \overline{)00} \\ \hline \end{array}$$

s.18 minus 3d. *Ans.* 17s. 9d. at 4 per cent.

By taking the $\frac{1}{3}$ from the answers of any of the calculations at 6 per cent. for days, you have the amount at 4 per cent.

RULE for interest at three per cent. for days — Calculate at 6 per cent. and take half. Or, Multiply the principal by half the days, or the days by half the principal, and proceed as in 6 per cent.

WHAT is the interest of L.80 for 80 days?

L.80

40 days, the $\frac{1}{2}$ of 80.

$$\begin{array}{r} 3 \overline{)00}32 \overline{)00} \\ \hline \end{array}$$

s.10 . 8 minus $1\frac{3}{4}$ d. *Ans.* 10s. $6\frac{1}{4}$ d.

What is the interest of L.95 for 90 days?

L.95

45 = $\frac{1}{2}$ 90 days.

$$\begin{array}{r} 3 \overline{)00}42 \overline{)75} \\ \hline \end{array}$$

s.14 . 3 minus $2\frac{1}{2}$ d. *Ans.* 14s. $0\frac{1}{2}$ d.

What is the interest of £129 for 81 days, at 3 per cent?

L 129 $124\frac{1}{2}$ over, at 4d. the 100, allow 5d.

$40\frac{1}{2}$ days.

$$\begin{array}{r} 3 \overline{)00}52 \overline{)24\frac{1}{2}} \\ \hline \end{array}$$

s.17 . 5 minus 3d. *Ans.* 17s. 2d.

RULE for interest at $3\frac{1}{2}$ per cent. for days.—Multiply the principal by the days, for each 100 they produce allow two-pence, which gives the interest at 3 per cent. to which add $\frac{1}{6}$ th. and you have the interest at $3\frac{1}{2}$ per cent. observing to deduct 1d. for each 6s. as the other Rules.

EXAMPLES.

WHAT is the interest of £30 for 20 days ?

$$\begin{array}{r} \text{£ } 30 \\ \quad 20 \text{ days.} \\ \hline 600 \text{ at } 2d. \text{ per } 100 = 1s. 0d. \text{ at } 3 \text{ per cent.} \\ \quad \text{add } \frac{1}{6} \quad \quad 2 \end{array}$$

Ans. s 1 . 2 at $3\frac{1}{2}$ per cent.

By dividing the product of the Multiplication by 600, it gives shillings, as the following

EXAMPLES.

WHAT is the interest of £60 for 60 days, at $3\frac{1}{2}$ per cent?

$$\begin{array}{r} \text{£ } 60 \\ \quad 60 \text{ days} \\ 6|00)36\ 00 \\ \text{add } \frac{1}{6})6s. \text{ at } 3 \text{ per cent.} \\ \quad 1s. \\ \hline \end{array}$$

Ans. 7s. minus $1\frac{1}{4}d.$ interest 6s. $10\frac{3}{4}d.$ at $3\frac{1}{2}$ per cent.

What is the interest of £90 for 80 days?

$$\begin{array}{r} \text{£ } 90 \\ \quad 80 \text{ days.} \\ 6|00)72|00 \\ \text{add } \frac{1}{6})12s. \text{ at } 3 \text{ per cent.} \\ \quad 2 \end{array}$$

14s. minus $2\frac{1}{2}d.$ interest 13s. $9\frac{1}{2}d.$ at $3\frac{1}{2}$ per cent.

What is the interest of £125 for 70 days?

$$\begin{array}{r} \text{£ } 125 \\ \quad 70 \text{ days.} \\ \hline 6|00)87|50 \quad 350 \text{ over at } 2d. \text{ per } 100 = 7d. \\ \text{add } \frac{1}{6})14 . 7 \\ \quad 2 . 5 \end{array}$$

Ans. 17s. minus 3d. interest 16s. 9d. at $3\frac{1}{2}$ per cent

What is the interest of £365 for 170 days?

$$\begin{array}{r} \text{£ } 365 \\ \quad 170 \text{ days.} \quad 250 \text{ over} = 5d. \\ 6|00)620|50 \\ \text{add } \frac{1}{6})103 . 5 \\ \quad 17 . 3 \text{ nearly.} \end{array}$$

Ans. s.120 . 8 minus 1s. 3d. interest £5 . 19 at $3\frac{1}{2}$.

What is the interest of $L\ 100$ for 365 days, at $3\frac{1}{2}$ per cent.?

$$\begin{array}{r}
 365 \text{ days} \\
 \underline{100L.} \qquad 500 \text{ at } 2d. \text{ per } 100 = 10d. \\
 6\overline{)00}365\overline{)00} \\
 \text{add } \frac{1}{6})60 \cdot 10 \\
 \underline{10 \ 1\frac{3}{4}} \\
 s.70 \cdot 11\frac{3}{4} \text{ minus } 11\frac{3}{4}a. \text{ interest } \pounds 3 \cdot 10 \text{ at } 3\frac{1}{2} \text{ Proof.}
 \end{array}$$

RULE for interest for days, at $2\frac{1}{2}$ per cent.—Calculate at 5 per cent. (see Rule) and take half, which will be the answer.

EXAMPLES.

WHAT is the interest of $L.60$ for 60 days, at $2\frac{1}{2}$ per cent

$$\begin{array}{r}
 L.60 \\
 20 \text{ is } \frac{1}{3} \text{ of } 60 \text{ days.} \\
 \underline{\hspace{1cm}} \\
 d.120\overline{)0} = \frac{1}{2})10s. \text{ at } 5 \text{ per cent. minus } 2d. \\
 \underline{\hspace{1cm}} \\
 5s. \text{ minus } 1d. \text{ Ans. } 4s. 11d.
 \end{array}$$

What is the interest of $\pounds 95$ for 33 days, at $2\frac{1}{2}$ per cent.?

$$\begin{array}{r}
 \pounds 95 \\
 11 \text{ is } = \frac{1}{3} \text{ of } 33. \\
 104\overline{)5} = \frac{1}{2})8s. \ 8\frac{1}{2}d. \\
 \underline{\hspace{1cm}} \\
 4 \cdot 4\frac{1}{4} \text{ minus } \frac{3}{4}d. \text{ Ans. } 4s. 3\frac{1}{2}d.
 \end{array}$$

What is the interest of $\pounds 185$ for 150 days?

$$\begin{array}{r}
 \pounds 185 \\
 50 \text{ is } \frac{1}{3} \text{ of } 150. \\
 \underline{\hspace{1cm}} \\
 925\overline{)0} = \pounds 3 \cdot 17 \cdot 1 \\
 \qquad \qquad \qquad 1 \cdot 1 \text{ minus.} \\
 \underline{\hspace{1cm}} \\
 \frac{1}{2})3 \cdot 16 \cdot 0 \text{ at } 5 \text{ per cent.} \\
 \pounds 1 \cdot 18 \cdot 0 \text{ at } 2\frac{1}{2} \text{ per cent.}
 \end{array}$$

It is immaterial whether the penny for every 6s. is taken off when at 5 per cent. or at $2\frac{1}{2}$ per cent.

What is the interest of $\pounds 360$ for 240 days?

$$\begin{array}{r}
 \pounds 360 \\
 80 \text{ is } \frac{1}{3} \text{ of } 240. \\
 \underline{\hspace{1cm}} \\
 d \ 2880\overline{)0} = \frac{1}{2})\pounds 12 \cdot 0 \cdot 0 \\
 \underline{\hspace{1cm}} \\
 6 \cdot 0 \cdot 0 \\
 \text{minus } 1 \cdot 8 \qquad \pounds 5 \cdot 18 \cdot 4. \text{ Ans.}
 \end{array}$$

What is the interest of £395 for 37 days?

£395

$12\frac{1}{2}$ is $\frac{1}{2}$ of 37 days.

$$\begin{array}{r} 4740 \\ 131\frac{1}{2} \\ \hline \end{array}$$

$$d.487|1\frac{1}{2} = \frac{1}{2}) \text{£}2 . 0 . 7$$

$$\begin{array}{r} 1 . 0 . 3\frac{1}{2} \\ \text{minus } 3\frac{1}{2} \\ \hline \text{£}1. \text{ Ans.} \end{array}$$

If the figure cut off were 5, the allowance for it would be $\frac{1}{2}d.$ consequently $1\frac{1}{2}$ can be of no value.

What is the interest of £ 100 for 365 days?

365 days.

$33\frac{1}{2}$

$$\begin{array}{r} 12045 \\ 121\frac{1}{2} \\ \hline \end{array}$$

$$1216|6 = \frac{1}{2}) \text{£}5 . 1 . 4\frac{1}{2}$$

$$2 . 10 . 8\frac{1}{4}$$

$$8\frac{1}{4} \text{ minus. } \text{£}2 . 10. \text{ Proof.}$$

When there is a large sum for many days, the interest may be found more advantageously by the following

RULE for Interest for days at 5 per cent.—Multiply the principal by the days. The product divided by 7300 gives pounds, the remainder divided by 365 gives shillings, and that remainder divided by 30, gives pence.

DEMONSTRATION.

If any principal be multiplied by the days for which you wish to find the interest, and the product divided by 365, the quotient, taken as shillings, will give the answer at 5 per cent. And though that method is often adopted in schools, &c. we here give an improvement on, and an explanation of the same. By dividing the product by 7300, which is 20 times 365, it will produce pounds; the remainder, divided by 365, will produce shillings; and that remainder by 30 (nearly) the days in a month, will give pence; observing if the 30 goes into, or measures the dividend without leaving a remainder, to put down a farthing less, by which you allow for dividing by only 30 instead of $30\frac{1}{12}$, the

average days of a month: should it not go exactly, but leave 5 or 6, they will compensate, and nothing need be allowed.

Note, Though this method possesses a decided advantage over any other way we have seen practised, yet it is superseded by the other method for 5 per cent. in page 76. You may convince yourself of the truth by inspecting £120 for 95 days (just following) done by both methods.

EXAMPLES.

WHAT is the interest of £100 for 365 days ?

$$\begin{array}{r} 365 \text{ days} \\ 100 \\ \hline 7300)36500(\text{£}5 \text{ Ans.} \\ \dots \end{array}$$

What is the interest of £120 for 95 days ?

$$\begin{array}{r} 95 \text{ days,} \\ 120 \\ \hline \text{L. s. d.} \\ 7300)11400 (1 \cdot 11 \cdot 2\frac{3}{4} \text{ at 5 per cent.} \\ 365)4100 \\ 450 \\ \hline 3|0)8|5 \end{array}$$

The above £120 for 95 days at 5 per cent. by the Rule laid down heretofore, by multiplying by $\frac{1}{3}$ of the principal.

$$\begin{array}{l} 95 \text{ days.} \\ 40 \text{ is } \frac{1}{3} \text{ of } \text{£}120. \\ \hline d \ 380 \overline{)0} = \text{£}1 \cdot 11 \cdot 8. \\ \text{minus } 5\frac{1}{4}d. \text{ Interest } \text{£}1 \cdot 11 \cdot 2\frac{3}{4}. \end{array}$$

RULE for Interest at £2 per cent. for days.—Calculate by the Rule for days at 6 per cent. (already given) and take $\frac{1}{3}$ of the amount.

Or, multiply the principal by $\frac{1}{3}$ of the days, or the days by $\frac{1}{3}$ of the principal, and divide by 300, gives the amount without the trouble of going into 6 per cent.

EXAMPLES.

What is the interest of £30 for 30 days ?

$$\begin{array}{r} \text{£}30 \\ 10 \text{ is } \frac{1}{3} \text{ of } 30. \\ \hline \end{array}$$

$$\begin{array}{r} 3|00)3|00 \\ \hline \end{array}$$

s. 1 *Ans.* at 2 per cent.

What is the interest of L. 75 for 84 days, at 2 per cent.

$$\begin{array}{r} 84 \\ 25 \text{ is } \frac{1}{3} \text{ of } 75. \\ \hline \end{array}$$

$$\begin{array}{r} 3|00)21|00 \\ \hline \end{array}$$

s. 7 minus $1\frac{1}{4}d.$ *Ans.* 6s. $10\frac{3}{4}d.$

What is the interest of L. 95 for 120 days ?

$$\begin{array}{r} \text{£}95 \\ 40 \text{ is } \frac{1}{3} \text{ of } 120. \\ \hline \end{array}$$

$$\begin{array}{r} 3|00)38|00 \\ \hline \end{array} \quad 200 \text{ over} = 3d.$$

s. 12. 8d. minus 2d. *Ans.* 12s. 6d.

What is the interest of £110 for 99 days ?

$$\begin{array}{r} \text{£}110 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} 3|00)36|30 \\ \hline \end{array} \quad 30 \text{ over} = 1d.$$

s. 12. 1 minus 2d. *Ans.* 11s. 11d.

What is the interest of L. 130 for 130 days ?

$$\begin{array}{r} \text{L.}130 \\ 130 \\ \hline \end{array}$$

$$\begin{array}{r} 3|00)169|00 \\ \hline \end{array}$$

$\frac{1}{3}$)56. 4 at 6 per cent.

s. 18. $9\frac{1}{4}d.$ minus 3d. *Ans.* 18s. $6\frac{1}{4}d.$

What is the interest of £195 for 150 days ?

$$\begin{array}{r} \text{£}195 \\ 50 \text{ is } \frac{1}{3} \text{ of } 150. \\ \hline \end{array}$$

$$\begin{array}{r} 3|00)97|50 \\ \hline \end{array}$$

s. 32. 6 minus $5\frac{1}{2}d.$ *Ans.* £1. 12. 0 $\frac{1}{2}$

What is the interest of *L.*395 for 240 days?

L. 395

80 is $\frac{1}{3}$ of 240.

3|00)316|00

s.105 . 4 minus 1s. $5\frac{1}{2}d.$ *Ans.* £5-3-10 $\frac{1}{2}$.

What is the interest of £100 for 365 days?

365 days.

100

3|00)365|00

121 . 8

L.

1 . 8 minus = $\frac{1}{3}$)6 . 0 . 0 at 6 per cent.

*L.*2 . 0 . 0 *Proof.*

Should Interest at $1\frac{1}{2}$ per cent. for days be required, by taking the quarter of 6 per cent. you have the answer: or if the Interest for days, at 1 per cent. by taking the $\frac{1}{6}$ of 6 per cent. you have the answer: or if it be found necessary to find the Interest for days at $\frac{1}{2}$ per cent. by taking $\frac{1}{12}$ of the amount of the Interest for days at 6 per cent. you have the answer.

As it is necessary in Calculating Interest for days, to know the number of days the sum has been at Interest, the following table will be found useful; which shews the number of days, from any day in one month, to the corresponding day in another month, through the year.

To	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
J	365	31	59	90	120	151	181	212	243	273	304	334
F	334	365	28	59	89	120	150	181	212	242	273	303
M	306	337	365	31	61	92	122	153	184	214	245	275
A	275	306	334	365	30	61	91	122	153	183	214	244
M	245	276	304	335	365	31	61	92	123	153	184	214
J	214	245	273	304	334	365	30	61	92	122	153	183
J	184	215	243	274	304	335	365	31	62	92	123	153
A	153	184	212	243	273	304	334	365	31	61	92	122
S	122	153	181	212	242	273	303	334	365	30	61	91
O	92	123	151	182	212	243	273	304	335	365	31	61
N	61	92	120	151	181	212	242	273	304	334	365	30
D	31	62	90	121	151	182	212	243	274	304	335	365

To find the number of days by the above table. Find

the month in the left-hand column of months, and also the month in the column of months at the top, and see the figures exactly opposite the month in the left-hand column and under the month in the column above, and they give the number of days from the day of the month in the left to the same day of the month in the top column.

Should the end of the month of February in a Leap-year occur, it will be necessary to add one day more to the number discovered by the table.

EXAMPLES.

How many days from the 1st of April to the 1st of March ?

Here opposite April and under March you find 334, which are the number of days from the 1st of April to the 1st of March.

Find the number of days from the 5th of January to the 5th of July.

See opposite January and under July the figures are 181, which are the days from the 5th of January to the 5th of July.

Find the number of days from the 7th of May to the 15th of December.

You find the figures in the column opposite May and under December are 214, which gives the number of days from the 7th of May to the 7th of December, but as it is required to know till the 15th of December you add the difference 8 days, making it 222 days, the answer.

Find the number of days from the 5th of November to the 3rd. of May.

Here from the 5th of November to the 5th of May is found to be (by the table) 181 days, but as it is only required to find to the 3rd. of May, 2 days must be deducted, leaving 179 days, the answer.

How many days from the 4th of June to the 1st of December ?

By the table it appears to be 183 days from the 4th of June to the 4th of December, but the time required being only to the 1st of December, leaves 3 days less.
Ans. 180 days.

Find the number of days from the 11th of April to the 17th of December.

From the 11th of April to the 11th of December, is found to be 244 days, which being 6 days less than the time required, you add the difference, which is 6 days, making the total 250 days, the answer.

What is the interest of £65 for 3 years, 4 months, and 20 days, at 6 per cent.?

<p>£65 yrs. mo.</p> <p>40 mo. = to 3 . 4</p> <hr style="width: 10%; margin-left: 0;"/> <p>260 0 = £13 . 0 . 0</p> <p style="padding-left: 100px;">4 . 3$\frac{1}{4}$</p> <hr style="width: 10%; margin-left: 0;"/> <p style="padding-left: 50px;">£13 . 4 . 3$\frac{1}{4}$ <i>Ans.</i></p>	<p>£65</p> <p>20 days.</p> <hr style="width: 10%; margin-left: 0;"/> <p>3 00)13 00</p> <hr style="width: 10%; margin-left: 0;"/> <p style="padding-left: 100px;">4 . 4 minus $\frac{3}{4}d.$</p>
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What is the interest of £85 for 4 years, 2 months, and 24 days, at 4 per cent.?

<p>£85</p> <p>50</p> <hr style="width: 10%; margin-left: 0;"/> <p style="padding-left: 100px;">£ s. d.</p> <p>425 0 = 21 . 5 . 0</p> <p style="padding-left: 100px;">6 . 8$\frac{1}{2}$</p> <hr style="width: 10%; margin-left: 0;"/> <p style="padding-left: 50px;">£14 . 7 . 9$\frac{1}{2}$ at 4 per cent.</p>	<p>£85</p> <p>24</p> <hr style="width: 10%; margin-left: 0;"/> <p>3 00)20 40</p> <hr style="width: 10%; margin-left: 0;"/> <p style="padding-left: 100px;">6 . 9$\frac{1}{2}$</p> <p style="padding-left: 100px;">1d. minus.</p> <p>{ deduct $\frac{1}{3}$) 21 . 11 . 8$\frac{1}{2}$ at 6 per cent.</p> <p>{ for 4 p.c. 7 . 3 . 11 at 2 per ct. being $\frac{1}{3}$ of 6 per cent.</p> <hr style="width: 10%; margin-left: 0;"/> <p style="padding-left: 50px;">£14 . 7 . 9$\frac{1}{2}$ at 4 per cent.</p>
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What is the interest of £90.7.6 for 6 years, 8 months and 24 days at 5 per cent.?

<p>yrs. mo. s. d. £ s. d.</p> <p>6 . 8 as 6.8 is $\frac{1}{3}$) 90.7.6</p> <hr style="width: 10%; margin-left: 0;"/> <p>interest for 6 yrs. 8 mo. 30.2.6 90.7.6</p> <p>interest for 24 days 5.11$\frac{1}{4}$ 8</p> <hr style="width: 10%; margin-left: 0;"/> <p style="padding-left: 50px;">£30.8. 5$\frac{1}{4}$ 72.3.0.0 = 6 . 0$\frac{1}{4}$</p> <p style="padding-left: 100px;">minus 1d.</p>	<p style="text-align: right;">s. d.</p>
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It will be seen that the three preceding sums at 6, 4, and 5 per cent. have been done by the Rules already laid down.

As it may be found necessary in the purchasing of property to know at what rate per cent. money may be laid out, it can be easily discovered by the following simple

RULE.—Divide the number of years' purchase into £100 and the result will be the per centage at which your money is laid out.

EXAMPLES.

If 13 years' purchase is given for an estate, the rental of which is £100 per annum, what per cent. do I get for my money?

13) £100

£7.13.10⁰/₁₃ *Ans.* which is nearly 7³/₄ per cent.

If 15 years' purchase is given for £150 per annum, at what rate per cent is the money laid out?

15) £100

Ans. £6²/₃ per cent. and the purchase money is £2250.

If 16 years' purchase money is given for £125 per annum, at what rate per cent. was the purchase?

16) £100

Ans. £6¹/₄ per cent. and the purchase money is £2000.

If 21 years' purchase money is given for £190 per annum, what per cent. has the purchaser for his money?

21) £100

Ans. £4.15.2⁶/₇ per cent. and the purchase money is £3990.

If 28 years' purchase money is given for an estate of £100 per annum, what per cent. has the purchaser for his money?

28) £100

Ans. £3.11.5¹/₇ per cent. and the purchase money is £2800.

To prove the accuracy of the above, multiply the per-centage by the number of years' purchase, which gives the annual rent.

In order to find out how money should be laid out in a purchase, so as to ascertain any given rate per cent.

RULE.—Divide the annual rental by the per centage, the quotient will be the number of years' purchase, which number of years' purchase multiplied by 100 gives the whole purchase money.

EXAMPLES.

If the annual rental of an estate be $L.100$ what must I give for it, that I may lay out my money at 4 per cent.?

$$4)£100$$

$$\begin{array}{r} 25 \\ 100 \end{array}$$

the number of years' purchase.
the annual rent.

$$£2500$$

the purchase money.

If the annual rental of an estate be $£50$ per annum, what number of years' purchase must be given in order to lay out the money at 3 per cent.?

$$3)£50$$

$$\begin{array}{r} 16\frac{2}{3} \\ 100 \end{array}$$

the number of years' purchase.

$$£1600 \cdot 13 \cdot 4$$

the purchase money.

Suppose the annual rent to be $£60$ what number of years' purchase must be given, so that the money may be laid out at 2 per cent.?

$$2)60 \text{ £}$$

$$\begin{array}{r} 30 \\ 100 \end{array}$$

years' purchase.

$$£3000$$

to be paid for the estate.

If I purchase an estate, the annual rent of which is $£150$ how many years' purchase should be given that my money be laid out at $3\frac{1}{2}$ per cent.?

$$\begin{array}{r} 3\frac{1}{2} \\ 2 \end{array} \begin{array}{r} 150 \text{ £} \\ 2 \end{array}$$

$$7) 300$$

$$\begin{array}{r} 42\frac{6}{7} \\ 100 \end{array}$$

years' purchase.

$$£4285\frac{5}{7}$$

to be paid for the estate.

If the annual rent of an estate be £500, how many years' purchase should be given for it, that $2\frac{1}{2}$ per cent. may be gained by the money laid out?

$$\begin{array}{r} 2\frac{1}{2} \quad 500 \text{ £.} \\ \underline{\quad \quad \quad} \\ 2 \quad \quad \quad 2 \end{array}$$

$$\begin{array}{r} 5)1000 \\ \underline{\quad \quad \quad} \end{array}$$

200 years' purchase to be given.
100

£20,000 the purchase money.

The above calculations prove themselves, by finding what the interest of the purchase money is at the same rate as the above sums are stated.

Thus: The purchase money of the last question is £20,000, being at interest at $2\frac{1}{2}$ per cent. per annum, produces £500, being the annual rent of the estate.

To compute in one operation the interest of several sums, advanced at different times, for the account of another person.

Bankers and merchants frequently advance sums of money for their correspondents, the interest whereof they charge on settling accounts with them.

The method of computing and stating an account of Interest, without the assistance of Interest tables.

1st. Find the sums due to you at each date of the account, beginning where you are at first in advance for your correspondent, thus:

The first disbursement, or payment, made by you out of your own cash, is the first sum due; the following sums due, at the several dates, are found by adding the payments made by you, or subtracting the receipts to or from the sum due at the last foregoing date respectively.

2nd In a line with each sum due, write the days from the date thereof to the date which follows next in order of time, whether the article be a payment or a receipt.

3rd. Multiply each sum due by its respective days, and write the product in the same line, a little farther to the right.

4th. Add the several products, and with the total, as if it were a single product of principal and days, pursue the directions for calculating Interest for days, as laid down just before.

A banker and merchant open an account current the 1st of January, 1834, the banker advancing the sum of £100 and proceeding as follows:

		Sums due.		No. of Days.		Products.	
1834.	£.	£					
Jan. 1, paid	100	100	×	15	=	1500	
.... 16, paid	50	150	×	16	=	2400	
Feb. 1, recd.	80	70	×	30	=	2100	
Mar. 2, paid	50	120	×	22	=	2640	
.... 24, recd.	80	40	×	11	=	440	
April 4, acct.	40						
						3|00)90|80	
						30 . 3	
						5 deduct.	
						£1 . 9.10 at 6 percent.	

If required to be found at 5 per cent. deduct $\frac{1}{6}$ th. from the amount of 6 per cent.

Clearer demonstration of the above calculation.

1834.		<i>Prod.</i>
Jan. 1, due £100; from the 1st to the 16th of Jan. 15 days, multiplied by 100		= 1500
.... 16, paid £50, with the £100 give £150; from 16th Jan. to 1st Feb. 16 days, multiplied by 150.....		= 2400
Feb. 1, recd. £80, deducted from £150 leave £70; from 1st Feb. to 2nd March 30 days, multiplied by 70.....		= 2100
Mar. 2, paid £50, with £70 before, give £120; from the 2nd to the 24th of Mar. 22 days, multiplied by 120		= 2640
.... 24, recd. £80; deducted from £120 leave £40; from 24th March to 4th of April, 11 days, multiplied by 40		= 440
		9080

The products divided by 300 give 30s. 3d., from which 5d. being deducted, there being 5 times 6s. in 30, leave the answer L. 1 . 9.10 at 6 per cent.

Another example of an Interest account, commencing the 15th of January and ending 4th of May, 1834, at 6 per cent.

Here we shall give the explanation previous to the form, which, like the former, is divided into five columns. The first contains the dates of the several sums paid or received: the second the sums paid or received on the respective days: the third contains the sums due at each date, which sums are found by adding the payment to the last sum due and by subtracting the receipts from the last sum due respectively: the fourth contains the numbers of the days from the date of the respective articles, to the date next following; and the fifth contains the products of each sum due multiplied by its respective days.

1834.	£	<i>Days. Prod.</i>
Jan. 15, adva	123	from Jan. 15 to 31st 16=1968
31, recd.	75	
	<hr/>	
due	48	from Jan. 31 to Feb. 10 10= 480
Feb. 10, paid	90	
	<hr/>	
due	138	from Feb. 10 to 22, 12=1656
.... 22, paid	47	
	<hr/>	
due	185	from Feb. 22 to Mar. 3 10=1850
Mar. 3, recd.	100	
	<hr/>	
due	85	from March 3 to 23 20=1700
.... 23, paid	55	
	<hr/>	
due	140	from Mar. 23 to Apr. 4 12=1680
April 4, recd.	100	
	<hr/>	
due	40	from Apr. 4 to May 4 30=1200
May 4, recd.	40	3 | 00) 105 | 34
		<hr/>
		35 . 1½
		deduct 5¾
		<hr/>
May 4. Interest due at 6 per cent.	£1.14 . 7¾	
At 5 per cent. deduct ½.....	5 . 9¼	
	<hr/>	
At 5 per cent.	£1 . 8.10½	

1834.	£	Sums due.	No. of	Products.
		£	Days.	
Jan. 15, paid	123	123	× 16	= 1968
.... 31, recd.	75	48	× 10	= 480
Feb. 10, paid	90	138	× 12	= 1656
.... 22, paid	47	185	× 10	= 1850
Mar. 3, recd.	100	85	× 20	= 1700
.... 23, paid	55	140	× 12	= 1680
April 4, recd.	100	40	× 30	= 1200

3|00)105|34

$\frac{1}{2}$)35.1 $\frac{1}{2}$ at 6 per cent.
11.8 $\frac{1}{2}$ at 4 per cent.

£1.3.5 at 4 per cent.

By deducting $\frac{1}{3}$ from 6 per cent you have 4 per cent. and by taking the $\frac{1}{3}$ of 6 you have 2 per cent. observing to take one penny for each six shillings off each amount.

An interest account at 5 per cent. opened February 4, 1833, and closed November 18, of the same year.

1833.	£	Sums due.	No. of	Products.
		£	Days.	
Feb. 4, paid	300	300	× 25	= 7500
.... 29, paid	100	400	× 10	= 4000
Mar. 10, recd.	250	150	× 20	= 3000
.... 30, paid	100	250	× 13	= 3250
April 12, recd.	220	30	× 54	= 1620
June 5, paid	450	480	× 63	= 30240
Aug. 7, recd.	300	180	× 33	= 5940
Sept. 9, paid	110	290	× 30	= 8700
Oct. 9, recd.	100	190	× 40	= 7600

£ s. d.

Nov. 18, settled account 7300)71850(9.16.10 *Ans.*

365)6150
2500

3|0)31|0

When the addition of the products is found, the second Rule for interest of days at £5 per cent. is best applied; that is, dividing by 7300 gives pounds for the quotient; the remainder by 365 give shillings for the quotient; and that remainder by 30, rejecting any fraction over, gives pence, which pounds, shillings and pence is the answer required, not being subject to

Take the discount off £160.17.8 at $12\frac{1}{2}$ per cent.

$$\begin{array}{r} 12\frac{1}{2} \text{ of } 100 \text{ is } \frac{1}{8}) \text{ £}160.17.8 \\ \quad 20. \quad 2.2\frac{1}{2} \text{ discount.} \\ \hline \text{£}140.15.5\frac{1}{2} \text{ net money.} \end{array}$$

Find the discount on £6580.0.10 at 20 per cent.

$$\begin{array}{r} 20 \text{ of } 100 \text{ is } \frac{1}{5}) \text{ £}6580.0.10 \\ \quad 1316.0. \quad 2 \text{ discount.} \\ \hline \text{£}5264.0. \quad 8 \text{ net money.} \end{array}$$

What is the discount on £17.8.2 at 25 per cent.?

$$\begin{array}{r} 25 \text{ of } 100 \text{ is } \frac{1}{4}) \text{ £}17.8.2 \\ \quad 4.7.0\frac{1}{2} \text{ discount.} \\ \hline \text{£}13.1.1\frac{1}{2} \text{ net money.} \end{array}$$

What is the discount on 7s. $10\frac{1}{2}d.$ at 50 per cent.?

$$\begin{array}{r} 50 \text{ of } 100 \text{ is } \frac{1}{2}) 7s. \quad 10\frac{1}{2}d. \\ \hline s.3. \quad 11\frac{1}{4} \text{ discount or net money.} \end{array}$$

Find the discount on £18.9.10 at 75 per cent.

$$\begin{array}{r} 75 \text{ of } 100 \text{ is } \frac{3}{4}) \text{ £}18. \quad 9.10 \\ \quad 4.12. \quad 5\frac{1}{2} \text{ net money.} \\ \hline \text{£}13.17. \quad 4\frac{1}{2} \text{ discount.} \end{array}$$

If the discount to be found is not an even part of 100, divide the sum by 20, the quotient is the discount at 5 per cent. which being multiplied by as many as there are 5 times contained in the discount you wish to find, gives the answer.

EXAMPLES.

TAKE the discount off £325.8.3 at 15 per cent.

$$\begin{array}{r} 20)325.8.3 \\ \hline 16.5.4\frac{19}{20} \text{ discount at } 5 \text{ per cent.} \\ \text{multiply by } \quad 3 \text{ as there are } 3 \text{ times in } 15. \\ \hline \text{£}48.16.2\frac{17}{20} \text{ or } \frac{3}{4}d. \text{ disc. at } 15 \text{ per cent.} \end{array}$$

By this method the exact fraction is discovered. which every person is at liberty to follow as they wish.

What is the discount on 4s. 10d. at 35 per cent.?

$$\begin{array}{r}
 20) 4s. 10d. \\
 \hline
 2 \frac{9}{10} \text{ at } 5 \text{ per cent.} \\
 \underline{7} \\
 \hline
 s. 1 \cdot 8 \frac{3}{10} \text{ at } 35 \text{ per cent.}
 \end{array}$$

Or thus: Multiply the sum on which the discount is to be discovered by as many as there are 5's in the discount to be taken off.* Consider the pounds produced as shillings, and allow for the shillings, if any, the same part of a shilling as they are of a pound.

EXAMPLES:

Find the discount on £7.8.4 at 15 per cent.

$$\begin{array}{r}
 £7.8.4 \\
 \quad 3 \\
 \hline
 £22.5.0
 \end{array}
 \quad
 \begin{array}{l}
 \text{The } £22 \text{ as shillings are } = £1.2, \\
 \text{and the } 5 \text{ in the shillings being } \frac{1}{4} \text{ of} \\
 \text{a } £ \text{ allow } 3d. \text{ the } \frac{1}{4} \text{ of a shilling.} \\
 \text{Ans. } £1.2.3.
 \end{array}$$

Find the discount on £27.3.10 at $17\frac{1}{2}$ per cent.

$$\begin{array}{r}
 £27.3.10 \\
 \quad 3\frac{1}{2} \\
 \hline
 81.11.6 \\
 13.11.11 \\
 \hline
 L.95. 3. 5
 \end{array}
 \quad
 \begin{array}{l}
 \text{The } L.95 \text{ as shillings } = L 4.15 \\
 \text{and as } 3s. 4d. \text{ is just } \frac{1}{6} \text{ of a pound,} \\
 \text{allow the } \frac{1}{6} \text{ of a shilling, } = 2d. \\
 \text{Ans. } £4.15.2.
 \end{array}$$

Find the discount on L.150.14.2 at $31\frac{1}{4}$ per cent.

$$\begin{array}{r}
 L.150.14.2 \\
 \quad 6\frac{1}{4} \\
 \hline
 904. 5.0 \\
 37.13.6\frac{1}{2} \\
 \hline
 £941.13.6\frac{1}{2}
 \end{array}
 \quad
 \begin{array}{l}
 \text{This } 31\frac{1}{4} \text{ contains } 6\frac{1}{4} \text{ times } 5, \\
 \text{and the } L.941 \text{ produced as shil-} \\
 \text{lings, } L.47.1 \text{ and the proportion} \\
 \text{that the } 18s. 6\frac{1}{2}d. \text{ bears to a } L \\
 \text{the same, or a little better, than} \\
 \text{that } 11d. \text{ bears to a shilling.} \\
 \text{Ans. } L.47.1.11 \text{ at } 31\frac{1}{4} \text{ per cent.}
 \end{array}$$

* That is, if the discount to be found is 15 per cent., multiply by 3, as there are 3 5's in 15.

The following Table of discounts will be found useful.

per cent.	In the £	per cent.	In the £	per cent.	In the £
$\frac{1}{8}$	is 0s: 0 $\frac{3}{10}$ d	$16\frac{1}{4}$	is 3s. 3d.	$37\frac{1}{2}$	is 7s. 6
$\frac{1}{4}$	is 0 0 $\frac{3}{5}$	$17\frac{1}{2}$	is 3 6	$38\frac{3}{4}$	is 7 9
$\frac{1}{2}$	is 0 1 $\frac{1}{5}$	$18\frac{3}{4}$	is 3 9	40	is 8
$\frac{3}{4}$	is 0 1 $\frac{4}{5}$	20	is 4 0	$41\frac{1}{4}$	is 8 3
1	is 0 2 $\frac{2}{5}$	$21\frac{1}{4}$	is 4 3	$42\frac{1}{2}$	is 8 6
$1\frac{1}{4}$	is 0 3	$22\frac{1}{2}$	is 4 6	$43\frac{3}{4}$	is 8 9
$2\frac{1}{2}$	is 0 6	$23\frac{3}{4}$	is 4 9	45	is 9 0
$3\frac{3}{4}$	is 0 9	25	is 5 0	$46\frac{1}{4}$	is 9 3
5	is 1 0	$26\frac{1}{4}$	is 5 3	$47\frac{1}{2}$	is 9 6
$6\frac{1}{4}$	is 1 3	$27\frac{1}{2}$	is 5 6	$48\frac{3}{4}$	is 9 9
$7\frac{1}{2}$	is 1 6	$28\frac{3}{4}$	is 5 9	50	is 10 0
$8\frac{3}{4}$	is 1 9	30	is 6 0	55	is 11 0
10	is 2 0	$31\frac{1}{4}$	is 6 3	60	is 12 0
$11\frac{1}{4}$	is 2 3	$32\frac{1}{2}$	is 6 6	65	is 13 0
$12\frac{1}{2}$	is 2 6	$33\frac{3}{4}$	is 6 9	70	is 14 0
$13\frac{3}{4}$	is 2 9	35	is 7 0	75	is 15 0
15	is 3 0	$36\frac{1}{4}$	is 7 3	80	is 16 0

By the foregoing table the discount may be found by finding first at 5 per cent. and multiplying as the case may require.

What is the discount on $L.125$ at 30 per cent.?

$$L.6.5 \text{ at 5 per cent.}$$

$$L.37.10 \text{ at 30 per cent.}$$

What is the discount on $L.28.10$ at 45 per cent.

$$L.1.8.6 \text{ at 5 per cent.}$$

$$L.12.16.6 \text{ at 45 per cent.}$$

What is the discount on $L.128.2.6$ at 70 per cent.?

$$L.6.8.1\frac{1}{2} \text{ at 5 per cent.}$$

$$L.89.13.9 \text{ at 70 per cent.}$$

By the above Rules and Examples, calculations may be made to any extent.

BRITISH AND FRENCH CURRENCY.

WE are indebted to a gentleman, who has resided a considerable time in France, for the following short method of bringing French currency into British, and British currency into French currency or francs.

RULE to bring francs into British pounds sterling.—Cut off the last two figures and multiply the remainder by 4, the product will be the answer in pounds.

Note, 25 francs are L.1 British.

EXAMPLES.

In 2500 francs how many pounds sterling ?

$$\begin{array}{r} 25|00 \text{ francs} \\ 4 \\ \hline \end{array}$$

Ans. L.100 British.

In 2600 francs how many pounds ?

$$\begin{array}{r} 26|00 \text{ francs.} \\ 4 \\ \hline \end{array}$$

Ans. L.104 British.

In 2720 francs how many pounds ?

$$\begin{array}{r} 27|20 \text{ francs.} \\ 4 \\ \hline \end{array}$$

L.108 and 20 francs over = L.108.16. *Ans.*

In 810 francs how many pounds ?

$$\begin{array}{r} 8|10 \text{ francs.} \\ 4 \\ \hline \end{array}$$

L.32 and 10 francs over = L.32.8. *Ans.*

In 3500 francs how many pounds ?

$$\begin{array}{r} 35|00 \text{ francs.} \\ 4 \\ \hline \end{array}$$

L.140 British. *Ans.*

In 5624 francs how many pounds ?

$$\begin{array}{r} 56|24 \text{ francs.} \\ 4 \\ \hline \end{array}$$

L.224 and 24 francs = L.224.19.2 $\frac{1}{2}$. *Ans.*

In 1805 francs how many pounds ?

$$\begin{array}{r} 18 \overline{)05 \text{ francs.}} \\ 4 \end{array}$$

$L.72$ and 5 francs = $L.72 \cdot 4$. *Ans.*

A franc being $9\frac{3}{4}d$. English, 5 must be 4s.

In 2026 francs how many pounds ?

$$\begin{array}{r} 20 \overline{)26 \text{ francs.}} \\ 4 \end{array}$$

$L.80$ and 26 francs.

$$26 \text{ francs} = 1 \cdot 0 \cdot 9\frac{3}{4}$$

$L.81 \cdot 0 \cdot 9\frac{3}{4}$ English. *Ans.*

In 20000 francs how many pounds ?

$$\begin{array}{r} 200 \overline{)00 \text{ francs.}} \\ 4 \end{array}$$

$L.800$ British. *Ans.*

In 1000000 francs how many pounds ?

$$\begin{array}{r} 10000 \overline{)00 \text{ francs.}} \\ 4 \end{array}$$

$L.40000$ British. *Ans.*

To bring British pounds to francs. **RULE**.—Divide by 4 and add two ciphers.

EXAMPLES.

In $L.100$ British how many francs ?

$$4)L.100$$

2500 francs. *Ans.*

In $L.104$ how many francs ?

$$4)L.104$$

2600 francs. *Ans.*

In $L.32 \cdot 8$ how many francs ?

$$4)L.32 \cdot 8$$

800 francs.

$$8s. \text{ over} = 10 \text{ francs.}$$

810 francs. *Ans.*

In $L.140$ how many francs ?

$$4)L.140$$

3500 francs. *Ans.*

In $L.224.19.2\frac{2}{3}$, how many francs?

$$\begin{array}{r} 4) \text{£}224 \\ \hline 5600 \\ 19s. 2\frac{2}{3}d. = 24 \text{ francs.} \\ \hline 5624 \text{ francs. } \textit{Ans.} \end{array}$$

In $\text{£}72.4$ how many francs?

$$\begin{array}{r} 4) \text{£}72.4 \\ \hline 1800 \\ 4s. = 5 \text{ francs.} \\ \hline 1805 \text{ francs. } \textit{Ans.} \end{array}$$

In $\text{£}81.0.9\frac{3}{4}$, how many francs?

$$\begin{array}{r} 4) \text{£}81.0.9\frac{3}{4} \\ \hline 2000 \\ L.1.0.9\frac{3}{4} = 26 \text{ francs.} \\ \hline 2026 \text{ francs. } \textit{Ans.} \end{array}$$

In $L.800$ British how many francs?

$$\begin{array}{r} 4) L.800 \\ \hline 20000 \text{ francs. } \textit{Ans.} \end{array}$$

In $L.40000$ how many francs?

$$\begin{array}{r} 4) L.40000 \\ \hline 100000 \text{ francs. } \textit{Ans.} \end{array}$$

It will be seen, by inspecting the foregoing calculations, that each of these Rules has been proved by the other.

A SHORT method for bringing boards, &c. &c. of various lengths, breadths, and thickness into feet.

RULE.—Consider the feet as pence, which reduce to shillings, or shillings and pence (mentally) which multiply by the inches.

EXAMPLES.

In a board 24 ft. long and 11 in. broad, how many feet?

$$\begin{array}{r} 24 \text{ ft. as } 24d. = 2s. \\ 11 \\ \hline 22 \text{ feet. } \textit{Ans.} \end{array}$$

A board 16 ft. long, 10 in. broad and 1 in. thick, how many feet?

$$\begin{array}{r} 1 \text{ ft. } 4 \text{ in.} \\ \underline{10} \\ \text{ft. } 13.4 \text{ in. } \textit{Ans.} \end{array}$$

A board $23\frac{1}{2}$ ft. long, 11 in. broad and 1 in. thick, how many feet?

$$\begin{array}{r} 1 \text{ ft. } 11\frac{1}{2} \text{ in.} \\ \underline{11} \\ \text{ft. } 21.6\frac{1}{2} \text{ in. } \textit{Ans.} \end{array}$$

A board $29\frac{3}{4}$ ft. long, 8 in. broad and 1 in. thick, how many feet?

$$\begin{array}{r} 2 \text{ ft. } 5\frac{3}{4} \text{ in.} \\ \underline{8} \\ \text{ft. } 19.10 \text{ in. } \textit{Ans.} \end{array}$$

A plank measuring 30 ft. long, 9 in. broad and 2 in. thick, how many feet?

$$\begin{array}{r} 2 \text{ ft. } 6 \text{ in.} \\ \underline{9} \\ \text{ft. } 22.6 \text{ in. if } 1 \text{ in. thick.} \\ \underline{2} \\ \text{ft. } 45.0 \text{ in. } \textit{Ans.} \end{array}$$

Three planks, 29 ft. long each, $7\frac{1}{2}$ in. broad and 2 in. thick, how many feet?

$$\begin{array}{r} 7 \text{ ft. } 3 \text{ in.} \\ \underline{15} \\ \text{ft. } 108.9 \text{ in. } \textit{Ans. by } 2. \end{array}$$

The thickness being 2 in. I multiply by 15 in preference to $7\frac{1}{2}$ first, and that product by 2.

Four planks, each 15 ft. long, $9\frac{1}{2}$ in. broad and 3 in. thick, how many feet?

$$\begin{array}{r} 5 \text{ ft.} \\ \underline{9\frac{1}{2}} \\ \underline{47\frac{1}{2}} \\ \underline{3} \\ \text{ft. } 142\frac{1}{2} \textit{ Ans} \end{array}$$

MENTAL CALCULATIONS.

IN calculating mentally the same method is to be adopted as when the figures are employed ; that is when the price is pence.

RULE.—Find the amount at one penny, and multiply by the price, which we shall illustrate by the following

EXAMPLES

WHAT would 24 *lbs.* cost at 2*d.* per *lb.* ?

Say, mentally, 24 at 1*d.* = 2*s.*
 , multiply by the price 2

—
4*s.* *Ans.*

What would 24 yards cost at 5*d.* per yard ?

Say, 24 at 1*d.* amount to 2*s.*
 multiply by the price 5

—
10*s.* *Ans.*

What would 36 gallons cost at 4*d.* per gallon ?

36 at 1*d.* amount to 3*s.*
 multiplied by 4*d.* the price.

—
12*s.* *Ans.*

What would 48 yards cost at 7*d.* per yard ?

48 at 1*d.* amount to 4*s.*
 multiplied by 7*d.* the price.

—
£ 1.8 *Ans.*

What would 48 *lbs.* cost at 8*d.* per *lb.* ?

48 at 1*d.* amount to 4*s.*
 multiply by 8*d.* the price.

—
£ 1.12 *Ans.*

What would 48 stones cost at 9*d.* per stone ?

48 at 1*d.* amount to 4*s.*
 multiply by 9*d.* the price.

—
£ 1.16 *Ans.*

What would 48 *lbs.* cost at 10*d.* per *lb.* ?

48 at 1*d.* amount to 4*s.*
 multiply by 10*d.* the price.

—
£ 2.0 *Ans.*

What will 60 gallons cost at 11*d.* per gallon ?

60 at 1*d.* amount to 5*s.*

multiply by 11*d.* the price.

£2.15 *Ans.*

What would 60 articles cost at 3*d.* each ?

60 at 1*d.* amount to 5*s.*

multiply by 3*d.* the price.

15*s.* *Ans.*

What would 72 yards come to at 7*d.* per yard ?

72 at 1*d.* amount to 6*s.*

multiply by 7*d.* the price.

£2.2 *Ans.*

What would 72 *lbs.* cost at 9*d.* per *lb.* ?

72 at 1*d.* amount to 6*s.*

multiply by 9*d.* the price.

£2.14 *Ans.*

What would 72 articles cost at 11*d.* each ?

72 articles at 1*d.* amount to 6*s.*

multiply by 11*d.* the price.

£3.6 *Ans.*

What would 84 gallons cost at 3*d.* each ?

84 at 1*d.* amount to 7*s.*

multiply by 3*d.* the price.

£1.1 *Ans.*

What would 84 yards cost at 4*d.* per yard ?

84 at 1*d.* amount to 7*s.*

multiply by 4*d.* the price.

£1.8 *Ans.*

What would 84 ounces cost at 5*d.* per ounce ?

84 ounces at 1*d.* amount to 7*s.*

multiply by 5*d.* the price.

£1.15 *Ans.*

What would 84 ounces cost at 6*d.* per ounce ?

$$\begin{array}{r} 84 \text{ ounces at } 1d. \text{ amount to } 7s. \\ \text{multiplied by } 6d. \text{ the price.} \\ \hline \text{£} 2 \cdot 2 \text{ Ans.} \end{array}$$

What will 96 gallons come to at 7*d.* per gallon ?

$$\begin{array}{r} 96 \text{ gallons at } 1d. \text{ amount to } 8s. \\ \text{multiplied by } 7d. \text{ the price.} \\ \hline \text{£} 2 \cdot 16 \text{ Ans.} \end{array}$$

Note, Should $\frac{1}{2}d.$ occur in the price when calculating mentally, take $\frac{1}{2}$ of what it comes to at 1*d.* which add in as in the following

EXAMPLES.

SUPPOSE 48 *lbs.* at 5 $\frac{1}{2}d.$ per *lb.*

$$\begin{array}{r} 48 \text{ lbs. at } 1d. \text{ amount to } 4s. \\ \text{multiplied by } 5\frac{1}{2} \\ \hline \text{£} 1 \cdot 2 \text{ Ans.} \end{array}$$

Here we say 48 yards or *lbs.* &c. at 1*d.* amount to 4*s.* being multiplied by 5 gives 20 shillings, the price at 5 pence, and the half of 4*s.* (what it comes to at 1*d.*) being 2, what it comes to at $\frac{1}{2}d.$ by adding both you have the amount at 5 $\frac{1}{2}d.$

What would 72 yards cost at 6 $\frac{1}{2}d.$ per yard ?

$$\begin{array}{r} 72 \text{ yards at } 1d. = 6s. \\ \text{multiplied by } 6\frac{1}{2} \\ \hline \text{£} 1 \cdot 19 \text{ Ans.} \end{array}$$

What will 96 yards cost at 7 $\frac{1}{2}d.$ per yard ?

$$\begin{array}{r} 96 \text{ yards at } 1d. \text{ amount to } 8s. \\ \text{multiplied by } 7\frac{1}{2} \\ \hline s. 60 \text{ Ans.} \end{array}$$

What would 120 gallons cost at 10 $\frac{1}{2}d.$ per gallon ?

$$\begin{array}{r} 120 \text{ gallons at } 1d. \text{ amount to } 10s. \\ \text{multiply by } 10\frac{1}{2} \\ \hline \text{£} 5 \cdot 5 \text{ Ans.} \end{array}$$

Note, Should $\frac{1}{4}$ occur in the price when calculating

mentally, take $\frac{1}{4}$ th of what it comes to at $1d.$ which add in as the following

EXAMPLES.

WHAT would 96 ounces cost at $8\frac{1}{4}d.$ per ounce ?

96 at $1d.$ amount to $8s.$
multiply by $8\frac{1}{4}$

 $\pounds 3.6$ *Ans.*

Here we say 96 at $1d.$ comes to $8s.$ which being multiplied by the 8 gives 64 shillings, and the quarter of 8 shillings being 2, what it comes to at $\frac{1}{4}d.$ gives 66 shillings, or $\pounds 3.6s.$ the price at $8\frac{1}{4}d.$

What would 108 ounces cost at $9\frac{1}{4}d.$ per ounce ?

108 ounces at $1d.$ amount to $9s.$
multiply by $9\frac{1}{4}$

 $\pounds 4.3.3$ *Ans.*

What would 120 gallons cost at $10\frac{1}{4}d.$ per gallon ?

120 gallons at $1d.$ amount to $10s.$
multiply by $10\frac{1}{4}$

 $\pounds 5.2.6$ *Ans.*

Note, Should $\frac{3}{4}d.$ occur in the price when calculating mentally, take $\frac{3}{4}$ quarters of what it comes to at $1d.$ which add as in the following

EXAMPLES.

SUPPOSE 96 gallons at $2\frac{3}{4}d.$ per gallon.

96 gallons at $1d.$ amount to $8s.$
multiply by $2\frac{3}{4}$

 $\pounds 1.2$ *Ans.*

Note, In this question 96 at a $1d.$ amount to $8s.$ which being multiplied by 2, gives $16s.$ then the $\frac{3}{4}$ quarters of 8 shillings being 6, which you add (being the price at 3 farthings) it gives 22 shillings, the amount of 96 at $2\frac{3}{4}d.$

What will 144 *lbs.* cost at $5\frac{3}{4}d.$ per *lb.* ?

144 *lbs.* at $1d.$ amount to $12s.$
multiply by $5\frac{3}{4}$

 $\pounds 3.9.0$ *Ans.*

		<i>per oz.</i>			<i>Answers.</i>			<i>per lb.</i>			<i>Answers.</i>		
<i>oz.</i>	<i>at</i>	<i>s.</i>	<i>d.</i>	<i>£</i>	<i>s</i>	<i>d</i>	<i>lbs.</i>	<i>at</i>	<i>s.</i>	<i>d.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>
96	at	0	$3\frac{3}{4}$	1	10	0	120	at	0	$4\frac{1}{4}$	2	2	6
96	at	0	$4\frac{1}{4}$	1	14	0	120	at	0	5	2	10	0
96	at	0	$5\frac{3}{4}$	2	6	0	120	at	0	$5\frac{1}{4}$	2	12	6
96	at	0	$6\frac{1}{4}$	2	10	0	120	at	0	$6\frac{1}{2}$	3	5	0
96	at	0	$6\frac{1}{2}$	2	12	0	120	at	0	$6\frac{3}{4}$	3	7	6
96	at	0	$6\frac{3}{4}$	2	14	0	120	at	0	7	3	10	0
96	at	0	$7\frac{1}{4}$	2	18	0	120	at	0	$7\frac{1}{4}$	3	12	6
96	at	0	$7\frac{1}{2}$	3	0	0	120	at	0	$7\frac{1}{2}$	3	15	0
96	at	0	$8\frac{3}{4}$	3	10	0	120	at	0	$7\frac{3}{4}$	3	17	6
96	at	0	9	3	12	0	120	at	0	8	4	0	0
96	at	0	$9\frac{1}{4}$	3	14	0	120	at	0	$8\frac{1}{4}$	4	2	6
96	at	0	$9\frac{3}{4}$	3	18	0	120	at	0	$8\frac{3}{4}$	4	5	0
96	at	0	$10\frac{1}{4}$	4	2	0	120	at	0	$8\frac{1}{2}$	4	7	6
96	at	0	$10\frac{3}{4}$	4	6	0	120	at	0	9	4	10	0
96	at	0	11	4	8	0	120	at	0	$9\frac{1}{2}$	4	15	0
96	at	0	$11\frac{1}{4}$	4	12	0	120	at	0	$10\frac{3}{4}$	5	7	6
96	at	0	$11\frac{3}{4}$	4	14	0	120	at	0	11	5	10	0
							120	at	0	$11\frac{1}{2}$	5	15	0
<i>gals.</i>	<i>at</i>	<i>per gal.</i>											
108	at	0	1	0	9	0							
108	at	0	3	1	7	0	132	at	0	1	0	11	0
108	at	0	$3\frac{1}{2}$	1	11	6	132	at	0	3	1	13	0
108	at	0	$4\frac{1}{4}$	1	18	3	132	at	0	$3\frac{1}{2}$	1	18	6
108	at	0	$5\frac{1}{2}$	2	9	6	132	at	0	$3\frac{3}{4}$	2	1	3
108	at	0	6	2	14	0	132	at	0	4	2	4	0
108	at	0	$6\frac{1}{4}$	2	16	3	132	at	0	$4\frac{1}{4}$	2	6	9
108	at	0	$7\frac{1}{2}$	3	7	6	132	at	0	5	2	15	0
108	at	0	$8\frac{3}{4}$	3	13	9	132	at	0	$5\frac{1}{2}$	3	0	6
108	at	0	9	4	1	0	132	at	0	$5\frac{3}{4}$	3	3	3
108	at	0	$9\frac{1}{2}$	4	5	6	132	at	0	7	3	17	0
108	at	0	10	4	10	0	132	at	0	$7\frac{1}{4}$	3	19	9
108	at	0	$10\frac{1}{2}$	4	14	6	132	at	0	$8\frac{1}{2}$	4	13	6
108	at	0	$10\frac{3}{4}$	4	16	9	132	at	0	9	4	19	0
108	at	0	11	4	19	0	132	at	0	$9\frac{1}{4}$	5	1	9
108	at	0	$11\frac{1}{2}$	5	3	0	132	at	0	10	5	10	0
<i>lbs.</i>	<i>at</i>	<i>per lb.</i>											
120	at	0	1	0	10	0	132	at	0	$10\frac{3}{4}$	5	18	3
120	at	0	3	1	10	0	132	at	0	11	6	1	0
120	at	0	$3\frac{1}{4}$	1	12	6	132	at	0	$11\frac{1}{2}$	6	6	6
120	at	0	$3\frac{1}{2}$	1	15	0							
120	at	0	$3\frac{3}{4}$	1	17	6							
120	at	0	4	2	0	0							
		<i>per oz.</i>					<i>per lb.</i>		<i>per oz.</i>				
		0	1				144	at	0	1	0	12	0
							144	at	0	3	1	16	0
							144	at	0	$3\frac{1}{4}$	1	19	0

lbs.	per lb.		Answers.			oz.	per oz.	
	s.	d.	£	s.	d.		s.	d.
144 at	0	3 $\frac{1}{2}$	2	2	0	37 at	5	
144 at	0	3 $\frac{3}{4}$	2	5	0	40 at	6	
144 at	0	4	2	8	0	48 at	6 $\frac{1}{4}$	
144 at	0	4 $\frac{1}{2}$	2	14	0	60 at	7 $\frac{1}{2}$	
144 at	0	4 $\frac{3}{4}$	2	17	0	72 at	7 $\frac{3}{4}$	
144 at	0	5	3	0	0	84 at	8 $\frac{1}{2}$	
144 at	0	5 $\frac{1}{4}$	3	3	0	90 at	10	
144 at	0	5 $\frac{1}{2}$	3	6	0	96 at	10 $\frac{3}{4}$	
144 at	0	5 $\frac{3}{4}$	3	9	0	100 at	4	
144 at	0	7	4	4	0	102 at	9	
144 at	0	7 $\frac{1}{4}$	4	7	0	120 at	3 $\frac{1}{2}$	
144 at	0	7 $\frac{1}{2}$	4	10	0	124 at	4	
144 at	0	7 $\frac{3}{4}$	4	13	0	126 at	6	
144 at	0	8	4	16	0	132 at	8 $\frac{1}{2}$	
144 at	0	8 $\frac{1}{4}$	4	19	0	144 at	9 $\frac{3}{4}$	
144 at	0	9 $\frac{1}{2}$	5	14	0	25 at	8	
144 at	0	10 $\frac{1}{4}$	6	9	0	16 at	3	
144 at	0	11	6	12	0	26 at	9	
144 at	0	11 $\frac{3}{4}$	7	1	0			

The foregoing tables have been inserted, to give Teachers and Parents an opportunity of interrogating youth of both sexes, in Mental Calculations, and from the explanations given, we flatter ourselves they can be done with ease to all parties. The Answers are not to be got by rote, but should be given from a knowledge of the method, for which reason answers have not been attached to the last column.

Having laid down a variety of calculations from 1 penny to 11 $\frac{3}{4}$ d. we shall now introduce some calculations to be solved Mentally, where the price is shillings.

Shillings and 3 pence.

Shillings and 6 pence.

Shillings and 9 pence.

yds.	per yd.		Answers.			yds.	per yd.		Answers.		
	s.	d.	£	s.	d.		s.	d.	£	s.	d.
60 at	1	0	3	0	0	60 at	6	0	18	0	0
60 at	2	0	6	0	0	60 at	7	0	21	0	0
60 at	3	0	9	0	0	60 at	8	0	24	0	0
60 at	4	0	12	0	0	60 at	9	0	27	0	0
60 at	5	0	15	0	0	60 at	10	0	30	0	0

		<i>per yd.</i>		<i>Answers</i>				<i>per yd.</i>		<i>Answers.</i>			
<i>yds.</i>		<i>s.</i>	<i>d.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>	<i>yds.</i>		<i>s.</i>	<i>d.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
60	at	11	0	33	0	0	100	at	5	0	25	0	0
60	at	12	0	36	0	0	100	at	5	6	27	10	0
							100	at	6	0	30	0	0
80	at	1	0	4	0	0	100	at	6	1	30	8	4
80	at	3	0	12	0	0	100	at	6	3	31	5	0
*80	at	3	3	13	0	0	100	at	7	0	35	0	0
80	at	3	6	14	0	0	100	at	8	3	41	5	0
80	at	4	0	16	0	0	100	at	8	6	42	10	0
80	at	4	3	17	0	0	100	at	9	1	45	8	4
80	at	4	6	18	0	0	100	at	10	2	50	16	8
80	at	4	9	19	0	0	100	at	10	6	52	10	0
80	at	5	0	20	0	0	100	at	11	3	56	5	0
80	at	5	3	21	0	0	100	at	12	0	60	0	0
80	at	5	6	22	9	0	100	at	12	2	60	16	8
80	at	5	9	23	0	0	100	at	12	9	63	15	0
80	at	6	0	24	0	0							
80	at	6	3	25	0	0	120	at	3	0	18	0	0
80	at	6	6	26	0	0	120	at	3	6	21	0	0
80	at	6	9	27	0	0	120	at	4	3	25	10	0
80	at	7	0	28	0	0	120	at	4	9	28	10	0
80	at	7	3	29	0	0	120	at	5	0	30	0	0
80	at	8	6	34	0	0	120	at	5	3	31	10	0
80	at	9	0	36	0	0	120	at	6	6	39	0	0
80	at	10	9	43	0	0	120	at	7	0	42	0	0
80	at	11	0	44	0	0	120	at	7	3	43	10	0
80	at	11	6	46	0	0	120	at	8	9	52	10	0
80	at	12	0	48	0	0	120	at	9	0	54	0	0
							120	at	9	3	55	10	0
100	at	3	0	15	0	0	120	at	10	9	64	10	0
100	at	3	6	17	10	0	120	at	11	1	66	10	0
100	at	4	0	20	0	0	120	at	11	6	69	0	0
100	at	4	1	20	8	4	120	at	12	0	72	0	0
							120	at	12	6	75	0	0
In the above, the 100 at							130	at	1	0	6	10	0
1s. is £5. at 4s. amount to							130	at	3	0	19	10	0
£20, in addition to which							130	at	4	0	26	0	0
100 at 1d. = 8s. 4d. give													
£20.8.4.													

* Here 80 at 1s. = £4.
 multiplied by $3\frac{1}{4}$
 gives the *Ans.* £13.

			<i>Answers.</i>						<i>Answers.</i>				
<i>per yd.</i>						<i>per yd.</i>							
<i>yds.</i>	<i>s.</i>	<i>d.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>	<i>yds.</i>	<i>s.</i>	<i>d.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>		
130	at	5	0	32	10	0	160	at	6	9	54	0	0
130	at	6	0	39	0	0	160	at	7	0	56	0	0
130	at	7	0	45	10	0	160	at	7	1	56	13	4
130	at	8	0	52	0	0	160	at	7	3	58	0	0
130	at	9	0	58	10	0	160	at	7	6	60	0	0
130	at	10	0	65	0	0	160	at	9	9	78	0	0
130	at	11	0	71	10	0	160	at	10	3	82	0	0
130	at	12	0	78	0	0	160	at	10	6	84	0	0
							160	at	10	9	86	0	0
140	at	3	0	21	0	0	160	at	11	0	88	0	0
140	at	3	6	24	10	0	160	at	11	1	88	13	4
140	at	4	0	28	0	0	160	at	11	3	90	0	0
140	at	4	3	29	15	0	160	at	11	6	92	0	0
140	at	4	6	31	10	0	160	at	11	9	94	0	0
140	at	5	3	36	15	0	160	at	12	0	96	0	0
140	at	6	6	45	10	0	160	at	12	3	98	0	0
140	at	7	3	50	15	0							
140	at	8	0	56	0	0	180	at	3	0	27	0	0
140	at	8	1	56	11	8	180	at	3	6	31	10	0
140	at	8	6	59	10	0	180	at	3	9	33	15	0
140	at	9	0	63	0	0	180	at	4	0	36	0	0
140	at	9	1	63	11	8	180	at	4	1	36	15	0
140	at	9	3	64	15	0	180	at	4	2	37	10	0
140	at	9	6	66	10	0	180	at	4	3	38	5	0
140	at	10	3	71	15	0	180	at	4	6	40	10	0
140	at	10	9	75	5	0	180	at	5	0	45	0	0
140	at	11	0	77	0	0	180	at	5	3	47	5	0
140	at	11	1	77	11	8	180	at	5	6	49	10	0
140	at	11	6	80	10	0	180	at	6	9	60	15	0
140	at	12	0	84	0	0	180	at	7	0	63	0	0
140	at	12	6	87	10	0	180	at	7	3	65	5	0
							180	at	7	6	67	10	0
160	at	3	0	24	0	0	180	at	7	9	69	15	0
160	at	3	6	28	0	0	180	at	8	0	72	0	0
160	at	4	0	32	0	0	180	at	8	1	72	15	0
160	at	4	1	32	13	4	180	at	8	3	74	5	0
160	at	4	3	34	0	0	180	at	9	0	81	0	0
160	at	4	6	36	0	0	180	at	9	6	85	10	0
160	at	4	9	38	0	0	180	at	10	3	92	5	0
160	at	5	0	40	0	0	180	at	11	0	99	0	0
160	at	5	3	42	0	0	180	at	11	6	103	10	0

<i>per yd.</i>			<i>Answers.</i>			<i>per yd.</i>			<i>Answers.</i>		
<i>yds.</i>	<i>s.</i>	<i>d.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>	<i>yds.</i>	<i>s.</i>	<i>d.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
180	at	12 0	108	0	0	200	at	11 6	115	0	0
200	at	3 0	30	0	0	200	at	12 0	120	0	0
200	at	3 3	32	10	0	200	at	12 6	125	0	0
200	at	3 6	35	0	0	61	at	3 0			
200	at	3 9	37	10	0	65	at	4 0			
200	at	4 3	42	10	0	80	at	4 3			
200	at	4 6	45	0	0	80	at	5 1			
200	at	4 9	47	10	0	100	at	7 9			
200	at	5 0	50	0	0	126	at	9 0			
200	at	5 1	50	16	8	140	at	9 6			
200	at	5 6	55	0	0	150	at	10 0			
200	at	6 0	60	0	0	163	at	11 0			
200	at	6 3	62	10	0	180	at	11 1			
200	at	6 6	65	0	0	180	at	11 6			
200	at	7 0	70	0	0	200	at	11 9			
200	at	7 9	77	10	0	24	at	3 0			
200	at	8 6	85	0	0	62	at	7 0			
200	at	9 3	92	10	0	68	at	9 0			
200	at	9 6	95	0	0	104	at	11 0			
200	at	9 9	97	10	0	240	at	3 6			
200	at	10 1	100	16	8	242	at	9 0			
200	at	11 0	110	0	0	17	at	3 0			

Having given extensive lists of Mental Calculations, with the answers annexed, that persons wishing it can improve themselves; and also, that Principals of Seminaries, or Heads of Families, can adopt the method, employed by the authors, in exercising their Pupils in calculations of the same description: a few have been added, where the price is both shillings and pence, without the answers, which can be solved with the same ease as those to which the answers are attached.

We shall now add some questions to exercise all the foregoing Rules; only a few of which shall be worked in full.

EXAMPLES.

WHAT will 26 yards cost at 5*d.* per yard?

Ans. 10*s.* 10*d.*

What will 34½ *lbs.* cost at 7*d.* per *lb.*?

Ans. £1.0.1½.

- What will $55\frac{1}{4}$ gallons cost at $8d.$ per gallon?
Ans. £1.16.10.
- What will $126\frac{3}{4}$ stone cost at $9d.$ per stone?
Ans. £4.15.0 $\frac{3}{4}$.
- What will $143\frac{1}{2}$ ounces cost at $10d.$ per ounce?
Ans. £6.3.5 $\frac{1}{4}$.
- What will 96 yards cost at $7\frac{1}{4}d.$ per yard?
Ans. £2.18.0.
- What will 108 *lbs.* cost at $8\frac{1}{2}d.$ per *lb.*?
Ans. £3.16.6.
- What will 240 gallons cost at $9\frac{3}{4}d.$ per gallon?
Ans. £9.15.0.
- What will 960 yards cost at $10\frac{3}{8}d.$ per yard?
Ans. £41.10.0.
- What will $152\frac{1}{2}$ *lbs.* cost at $8\frac{1}{4}d.$ per *lb.*?
Ans. £5.4.10 $\frac{1}{8}$.
- What will $160\frac{1}{4}$ gallons cost at $10\frac{3}{4}d.$ per gallon?
Ans. £7.3.6 $\frac{11}{16}$. or $\frac{1}{2}d.$

Note, The price of all the above is to be found at $1d.$ and multiplied by the price.

EXAMPLES.

THE price of each of the following is to be found at $1s.$ and multiplied by the price.

- What will 44 gallons cost at $11s.$ per gallon?
Ans. £24.4.0.
- What will 96 yards cost at $9s.$ per yard?
Ans. £43.4.
- What will 97 yards cost at $7s.$ per yard?
Ans. £33.19.0.
- What will $89\frac{1}{4}$ gallons cost at $8s.$ per gallon?
Ans. £35.14.0.
- What will $91\frac{1}{2}$ ounces cost at $9s.$ per ounce?
Ans. £41.3.6.
- What will $93\frac{3}{4}$ yards cost at $7s.$ per yard?
Ans. £32.16.3.
- What will $104\frac{1}{2}$ ounces cost at $10s.$ per ounce?
Ans. £52.1.3.
- What will 44 yards cost at $4s. 1d.$ per yard?
Ans. £8.19.8.
- What will 66 yards cost at $5s. 2d.$ per yard?
Ans. £17.1.0.
- What will $91\frac{1}{2}$ gallons cost at $8s. 1d.$ per gallon?
Ans. £36.19.7 $\frac{1}{2}$.

What will $110\frac{1}{4}$ ounces cost at 8s. 2d. per ounce?

£5. 10 . 3 at 1s.

8 2

18s. $4\frac{1}{2}$ d. to bring in.

£45 . 0 . $4\frac{1}{2}$. *Ans.*

All the above should be done in one line, by the above method.

What would 80 yards cost at 3s. 3d. per yard?

£4

$3\frac{1}{4}$

£13 *Ans.*

What would 84 gallons cost at 5s. 6d. per gallon?

Ans. £23. 2.

What would 90 yards cost at 6s. 9d. per yard?

Ans. £30. 7. 6.

What will 124 gallons cost at 10s. 3d. per gallon?

Ans. £63. 11.

What will $145\frac{1}{2}$ ounces cost at 11s. 3d. per ounce?

Ans. £81. 16. $10\frac{1}{2}$.

What will $163\frac{3}{4}$ yards cost at 12s. 6d. per yard?

£8 . 3 . 9

$12\frac{1}{2}$

£4. 1. $10\frac{1}{2}$. to bring in.

£102 . 6. $10\frac{1}{2}$ *Ans.*

What will $181\frac{1}{2}$ yards cost at 11s. 3d. per yard?

Ans. £102. 1. $10\frac{1}{2}$.

What will $204\frac{3}{4}$ stones cost at 7s. 9d. per stone?

Ans. £79. 6. $9\frac{3}{4}$.

The following calculations being similar to the foregoing, may be done by the Rule laid down: viz. By taking the pence, of the price of one article, as shillings, by which you have the price of a dozen articles, which being multiplied by the number of dozens in the quantity, you have the answer.

EXAMPLES

WHAT will 24 articles cost at 7s. 3d. each?

£4 . 7

2

£8. 14 *Ans.*

What will 132 articles cost at 8s. 9½d. each?

$$\begin{array}{r} £5 \cdot 5 \cdot 6 \\ 11 \\ \hline \end{array}$$

£58 . 0 . 6 *Ans.*

What will 108 articles cost at 15s. 7¼d. each?

Ans. £84.9.9.

What will 72 articles cost at 3s. 10½d. each?

Ans. £13.19.

What will 84 articles cost at 5s. 8¼d. each?

Ans. £23.16.10½.

What will 102 articles cost at 12s. 8½d. each?

$$\begin{array}{r} £7 \cdot 12 \cdot 6 \text{ the price of 1 dozen.} \\ 8\frac{1}{2} \text{ dozen, being} = 102. \\ \hline \end{array}$$

£64.16 . 3 *Ans.*

What will 147 articles cost at 17s. 10¾d. each?

$$£10 \cdot 14 \cdot 9$$

$$12\frac{1}{4}$$

£2.13 . 8¼. to bring in.

£131.10 . 8¼ *Ans.*

What will 181 articles cost at 16s. 8¾d. each?

$$£10 \cdot 0 \cdot 9$$

$$15$$

16s. 8¾d. price of 1 to bring in.

£151 . 7.11¾ *Ans.*

MISCELLANEOUS EXAMPLES.

2 cwt. 2 qrs. 24 lbs. at	5d. per lb.	<i>Ans.</i>	£6	6	8
2 cwt. 3 qrs. 14 lbs. at	6d per lb.	<i>Ans.</i>	£3	1	0
3 cwt. 3 qrs. 12 lbs. at	6½d. per lb.	<i>Ans.</i>	£11	14	0
3 cwt. 3 qrs. 24 lbs. at	7d. per lb.	<i>Ans.</i>	£11	19	0
4 cwt. 2 qrs. 20 lbs. at	7½d. per lb.	<i>Ans.</i>	£16	7	6
5 cwt. 2 qrs. 16 lbs. at	8d. per lb.	<i>Ans.</i>	£21	1	4
6 cwt. 1 qr. 20 lbs. at	8¼d. per lb.	<i>Ans.</i>	£24	15	0
7 cwt. 2 qrs. 20 lbs. at	8½d. per lb.	<i>Ans.</i>	£30	9	2
8 cwt. 2 qrs. 17 lbs. at	9d. per lb.	<i>Ans.</i>	£36	6	9
8 cwt. 3 qrs. 20 lbs. at	9½d. per lb.	<i>Ans.</i>	£39	11	3
9 cwt. 2 qrs. 16 lbs. at	10¼d. per lb.	<i>Ans.</i>	£46	2	6
9 cwt. 2 qrs. 20 lbs. at	10½d. per lb.	<i>Ans.</i>	£47	8	6
10 cwt. 2 qrs. 24 lbs. at	10¾d. per lb.	<i>Ans.</i>	£53	15	0
12 cwt. 0 qrs. 12 lbs. at	11d. per lb.	<i>Ans.</i>	£62	3	0
16 cwt. 2 qrs. 20 lbs. at	11½d. per lb.	<i>Ans.</i>	£89	10	2

24 cwt. 1 qr 8 lbs. at $4\frac{1}{2}d.$ per lb. *Ans.* £51 1 6.

26 cwt. 2 qrs. 18 lbs. at 1s. 8d. per lb. *Ans.* £248 16 8.

Note, 1s. 8d. is one-twelfth of a £.

3 t. 3 cwt. 0 qrs. 5 lbs. at 2s. 6d. per lb. *Ans.* £882 12 6

11 cwt. 3 qrs. 26 lbs. at 84s. per cwt. *Ans.* £50 6 6

10 cwt. 0 qrs. 2 lbs. at 93s. 4d. per cwt. *Ans.* £46 15 0

11 cwt. 3 qrs. 26 lbs. at £5.12. per cwt. *Ans.* £67 2 0

9 cwt. 2 qrs. at £5.10.6 per cwt. *Ans.* £52 9 9

75 cwt. 3 qrs. 7 lbs. at £6.1.8 per cwt. *Ans.* £461 3 10 $\frac{1}{4}$.

290 cwt. 3 qrs. 14 lbs. at £4.2.6 per cwt. *Ans.* £1199 17 2 $\frac{1}{4}$.

61 acres 2 roods 8 perches at £3.10 per acre. *Ans.* £215 8 6.

76 acres 3 roods 24 perches at £4.6.8 per acre. *Ans.* £333 4 8.

576 acres 3 roods 26 perches at £7.1 per acre. *Ans.* £4076 4 7 $\frac{3}{4}$.

15 oz. 3 dwts. 4 grs. at 3s. 4d. per oz. *Ans.* £2 11 4 $\frac{1}{4}$.

146 oz. 16 dwts. 18 grs. at £3.10 per oz. *Ans.* £517 8 7 $\frac{1}{2}$.

60 oz. 7 dwts. at 8s. 6d. per oz. *Ans.* £25 12 11 $\frac{1}{2}$.

Interest of £20 for 5 months at 5 per cent. *Ans.* 8s. 4d.

Interest of £22 for 7 months at 5 per cent. *Ans.* 12s. 10d.

Interest of £27 for 8 months at 5 per cent. *Ans.* 18s.

Interest of £33 for 11 months at 5 per cent. *Ans.* £1 10 3.

Interest of £36.10s. for 6 months at 5 per cent. *Ans.* 18s. 3d.

Interest of £39.15s. for 4 months at 5 per cent. *Ans.* 13s. 3d.

Interest of £17.5s. for 6 months at 5 per cent. *Ans.* £1 3 7 $\frac{1}{2}$.

Interest of £55.10s. for 10 months at 5 per cent. *Ans.* £2 6 3.

Interest of £99.15s. for 8 months at 5 per cent. *Ans.* £3 6 6.

Interest of £136 2s. 6d. for 8 months at 5 per cent. *Ans.* £4 4 1.

Interest of £133 15s. for 11 months at 5 per cent. *Ans.* £6 2 7 $\frac{1}{4}$.

Interest of £999 15s. for 8 months at 5 per cent. *Ans.* £33 6 6.

Interest of £21 for 6 months at 6 per cent.

Ans. 12s. 7½d.

Interest of £31 for 7 months at 6 per cent.

Ans. £1 1 8¾.

Interest of £46 10s. for 6 months at 6 per cent.

Ans. £1 7 10¼.

Interest of £66 15s. for 4 months at 6 per cent.

Ans. £1 6 8¾.

Interest of £75 15s. for 8 months at 6 per cent.

Ans. £3 0 7¼.

Interest of £95 10s. for 10 months at 6 per cent.

Ans. £4 15 6.

Interest of £125 for 11 months at 6 per cent.

Ans. £6 17 6.

Interest of £175 10s. for 10 months at 6 per cent.

Ans. £8 15 6.

Interest of £240 10s. for 11 months at 6 per cent.

Ans. £13 4 6½.

Interest of £45 for 6 months at 4 per cent.

Ans. 18s. 0d.

Interest of £60 for 8 months at 4 per cent.

Ans. £1 12 0.

Interest of £70 10s. 6d. for 9 months at 4 per cent.

Ans. £2 2 3¾.

Interest of £85 15s. for 4 months at 4 per cent.

Ans. £1 2 10¾.

Interest of £40 for 6 months at 4½ per cent.

Ans. 18s. 0d.

Interest of £50 for 7 months at 4½ per cent.

Ans. £1 6 3.

Interest of £60 for 11 months at 4½ per cent.

Ans. £2 9 6.

Interest of £75 10s. for 3 months at 4½ per cent.

Ans. £2 5 3¾.

Interest of £85 10s. for 12 months at 4½ per cent.

Ans. £3 16 11¼.

Interest of £95 6s. 8d. for 1 year and 4 months at 4½ per cent.

Ans. £5 14 4¾.

Interest of £135 for 1 year and 8 months at 4½ per cent.

Ans. £10 2 6.

Interest of £775 10s. for 1 year and 10 months at 4½ per cent.

Ans. £63 19 6¾.

- Interest of $L.325$ for 1 month at 3 per cent. *Ans.* 16s. 3d.
- Interest of $L.47$ 10s. for 5 months at 3 per cent. *Ans.* 11s. $10\frac{1}{2}$ d.
- Interest of $L.128$ 5s. for 6 months at 3 per cent. *Ans.* L 1 18 $5\frac{1}{2}$.
- Interest of $L.207$ for 7 months at 3 per cent. *Ans.* $L.3$ 12 $5\frac{1}{2}$.
- Interest of $L.17$ 10s. for 10 months at 3 per cent. *Ans.* 8s. 9d.
- Interest of $L.1406$ for 12 months at 3 per cent. *Ans.* L 42 3 $7\frac{1}{2}$.
- Interest of $L.7$ 6s. 8d. for 14 months at 3 per cent. *Ans.* 5s. $1\frac{1}{2}$ d.
- Interest of $L.123$ 17s. 6d. for 9 months at 3 per cent. *Ans.* $L.2$ 15 9.
- Interest of $L.145$ 10s. for 11 months at 3 per cent. *Ans.* $L.4$ 0 $0\frac{1}{4}$ d.
- Interest of $L.165$ 5s. for 8 months at 3 per cent. *Ans.* $L.3$ 6 $1\frac{1}{2}$ d.
- Interest of $L.175$ 6s. 8d. for 12 months at 3 per cent. *Ans.* $L.5$ 5 $2\frac{1}{2}$ d.
- Interest of $L.49$ for 4 months at $2\frac{1}{2}$ per cent. *Ans.* 8s. 2d.
- Interest of $L.66$ 15s. for 3 months at $2\frac{1}{2}$ per cent. *Ans.* 8s. $4\frac{1}{2}$ d.
- Interest of $L.99$ 15s. for 8 months at $2\frac{1}{2}$ per cent. *Ans.* $L.1$ 13 3.
- Interest of $L.240$ for 11 months at $2\frac{1}{2}$ per cent. *Ans.* $L.5$ 10.
- Interest of $L.360$ for 8 months at $2\frac{1}{2}$ per cent. *Ans.* $L.6$ 0.
- Interest of $L.365$ for 1 year 8 months at $2\frac{1}{2}$ per cent. *Ans.* $L.15$ 4 2.
- Interest of $L.65$ for 21 days at 5 per cent. *Ans.* 3s. 9d.
- Interest of $L.480$ 10s. for 30 days at 5 per cent. *Ans.* $L.2$ 7 $4\frac{1}{2}$.
- Interest of $L.120$ for 90 days at 6 per cent. *Ans.* $L.1$ 9 7.
- Interest of $L.45$ for 40 days at 6 per cent. *Ans.* 5s. 11d.
- Interest of $L.127$ for 30 days at 3 per cent. *Ans.* 16s. 8d.

- Amount of 17 yards of calico at 11*d.* per yard.
Ans. 15*s.* 7*d.*
- Amount of 19½ yards at 10*d.* per yard.
Ans. 16*s.* 3*d.*
- Amount of 22¾ *lbs.* of sugar at 8*d.* per *lb.*
Ans. 15*s.* 2*d.*
- Amount of 27½ *lbs.* of lump sugar at 11*d.* per *lb.*
Ans. £1 5 2½.
- Amount of 39¾ *lbs.* of starch at 8*d.* per *lb.*
Ans. £1 6 6.
- Amount of 45¼ *oz.* of tea at 10*d.* per *oz.*
Ans. £1 17 8½.
- Amount of 66¾ *lbs.* of lamb at 8*d.* per *lb.*
Ans. £2 4 6.
- Amount of 99¼ *lbs.* of bacon at 10*d.* per *lb.*
Ans. £4 2 8½.
- Amount of 120 yards of muslin at 10¾*d.* per yard.
Ans. £5 7 6.
- Amount of 133 yards of stuff at 11½*d.* per yard.
Ans. £6 7 5½*d.*
- Amount of 144½ yards of riband at 8¼*d.* per yard.
Ans. £4 19. 4½.
- Amount of 365½ yards of lace at 10½*d.* per yard.
Ans. £15 19 9¾.
- Amount of 241 pair of gloves at 11¾*d.* per pair.
Ans. £11 8 5¾.
- Amount of 961 pair of gloves at 7¾*d.* per pair.
Ans. £31 10 7½.
- Amount of 1680 yards of lace at 7½*d.* per yard.
Ans. £49 17 6.
- Amount of 2000 yards of lace at 9¼*d.* per yard.
Ans. £77 1 8.
- Amount of 24 yards of silk at 2*s.* 3*d.* per yard.
Ans. £2 14 0.
- Amount of 26 yards of silk at 3*s.* 5*d.* per yard.
Ans. £4 8 10.
- Amount of 31 *lbs.* of tea at 4*s.* 2*d.* per *lb.*
Ans. £6 9 2.
- Amount of 44 *lbs.* of tea at 3*s.* 9*d.* per *lb.*
Ans. £8 5 0.
- Amount of 66 *lbs.* of tea at 5*s.* 6*d.* per *lb.*
Ans. £.18 3 0.
- Amount of 81 *lbs.* of tea at 6*s.* 9*d.* per *lb.*
Ans. £27 6 9.

- Amount of 121 *lbs.* of tea at 6s. 10½*d.* per *lb.*
Ans. L.41 11 10½.
- Amount of 161 gallons of gin at 11s. 3*d.* per gallon.
Ans. L.90 11 3.
- Amount of 240 tons of coal at 11s. 11¾*d.* per ton.
Ans. L.143 15 0.
- Amount of 180 tons of coal at 16s. 9*d.* per ton.
Ans. L.150 15 0.
- Amount of 27½ *cwt.* of cheese at 12s. per *cwt.*
Ans. L.16 10 0.
- Amount of 122 *cwt.* at 17s. 9*d.* per *cwt.*
Ans. L.108 5 6.
- Amount of 142 *cwt.* 2 *qrs.* at 19s. 6*d.* per *cwt.*
Ans. L.138 18 9.
- Amount of 162 *cwt.* 1 *qr.* at 7s. 6*d.* per *cwt.*
Ans. L.60 16 10½.
- Amount of 242½ of any thing at 12s. 9*d.* each
Ans. £154 7 1

GAIN PER CENT.

IN estimating a profit as a rate per cent. persons are not agreed, and the practice of some traders, and the theory of the schools, are at variance.

Suppose we buy at 4 and sell at 5, the Arithmetician reckons this a gain of 1 on 4, or 25 per cent. while the Trader, counting on the selling price, makes it a gain of only 1 on 5, or 20 per cent.; as every person is at liberty to adopt which method he considers correct, we shall here introduce Rules to discover the rate per cent. gained, applicable to both on either method.

To find the gain per cent. counting on the *cost price.*

RULE.—Find what part the gain is of the *first cost*, and divide £100 by the same, the product is your gain per cent.

To find the gain per cent. counting on the *selling price.*

RULE.—Find what part the gain is of the *selling*

price, and divide £100 by the same, the product is your gain per cent.

EXAMPLES. *Calculating on first cost price.*

Bought silk handkerchiefs at 5s. and sold them for 5s. 10d. each, what is the gain per cent ?

$$10d. \text{ of } 5s. \text{ is } \frac{1}{6})100$$

$$\text{£}16.13.4 \text{ gain per cent.}$$

That is, if you had laid out £ 100 in the purchase of articles at 5s. each, and sold them at 5s. 10d. each, you would on the expenditure of £ 100 have gained £.16.13.4 or $16\frac{2}{3}$ per cent.

Bought tea at 5s. 4d. per lb. and sold it at 6s. what is the gain per cent. ?

The difference between 5s. 4d. cost, and 6s. selling price, is 8d.

8d. of 5s. 4d. is $\frac{8}{54}$, 8 divided into £ 100 gives $12\frac{1}{2}$ per cent.

Bought cheese at 8d. per lb. and sold at 10d. what is the gain per cent. ?

$$2d. \text{ gain, is of cost price } \frac{1}{4})100$$

$$\text{L.}25 \text{ gain per cent.}$$

Bought mustard at 10d. per lb. and sold it at 11½d. what is the gain per cent. ?

$$1d. \text{ of } 10d. \text{ is } \frac{1}{10})100$$

$$\begin{array}{r} 10 \\ \frac{1}{2}d. \text{ of } 1d. \text{ is } \frac{1}{2} \quad 5 \end{array}$$

$$\text{L.}15 \text{ gain per cent.}$$

Bought at 2s. 6d. and sold at 3s. 0½d. what is the gain per cent. ?

$$6d. \text{ of } 2s. 6d. \text{ is } \frac{1}{5})100$$

$$\begin{array}{r} 20 \\ \frac{1}{2}d. \text{ of } 6 \text{ is } \frac{1}{12} \quad 1.13.4 \end{array}$$

$$\text{L } 21.13.4 \text{ gain per cent.}$$

Bought at 1s. and sold at 1s. 0½d. what is the gain per cent ?

$$\frac{1}{2}d \text{ of } 1s \text{ is } \frac{1}{21})100$$

$$\text{L.}4.3.4 \text{ gain per cent.}$$

EXAMPLES. *Calculating on the selling price.*

Bought gunpowder at 2s. 6d. per lb. and sold it at 3s. what is the gain per cent.?

3s. gain 6d. which is $\frac{1}{6}$ part 6)100

$$\underline{L.16 \cdot 13 \cdot 4} \text{ gain per cent.}$$

Bought mahogany at 19d. the foot, and sold it at 20d. what is the gain per cent.?

$$20d. \text{ gained, } 1d. \frac{1}{20})100$$

$$\underline{L.5} \text{ gain per cent.}$$

Bought at 8d. and sold at $9\frac{1}{2}d.$ what is the gain per cent.?

$9\frac{1}{2}d.$ gained $1\frac{1}{2}d.$

$\frac{1}{2}d.$ of $9\frac{1}{2}d.$ is $\frac{1}{19})100$

$$\underline{\quad 5\frac{5}{19}} \\ \quad 3$$

$$L.15\frac{15}{19} \text{ gain per cent. or } L.15 \cdot 15 \cdot 9\frac{9}{19} \text{ being about } 15\frac{3}{4} \text{ per cent.}$$

When the gain is an awkward part of either the cost or selling price, the following method can be resorted to with advantage:

Bought chocolate at $15\frac{1}{4}d.$ and sold it at $17\frac{1}{2}d.$ required the rate per cent. estimating on the *selling* price.

$17\frac{1}{2}d.$ gained $2\frac{1}{4}d.$ being the difference between the two prices.

If 70 gain 9, what will 100 gain.

$$\begin{array}{r} 100 \\ \quad 9 \\ \hline 70)900(12\frac{6}{7}, \text{ nearly } 13 \text{ per cent.} \\ \quad 200 \\ \hline 10 \left\{ \begin{array}{l} 60 \\ \hline 70 \end{array} \right\} \frac{6}{7} \end{array}$$

The same, estimating on the *cost* price.

$15\frac{1}{4}d.$ gained $2\frac{1}{4}d.$ being the difference between what is given and what is received for the article.

If 61 gain 9, what will 100 gain.

$$\begin{array}{r} 100 \\ \quad 9 \\ \hline 61)900(14 \cdot 18 \cdot 4\frac{20}{61} \text{ nearly } 15 \text{ per cent.} \\ \quad 290 \\ \hline \quad 56 \\ \quad \hline \quad 61 \end{array} \left\{ \begin{array}{l} \\ \\ \end{array} \right\} 18 \cdot 4\frac{20}{61}$$

The preceding show the difference between estimating on the *cost* and *selling* price.

An abbreviated method of dividing sums of money by 100 and 20, and by subdivision, facilitating the operation of dividing by any number of hundreds.

RULE for dividing by 100 in one line of figures, or at a glance—Cut off 2 figures to the right (the units and tens) consider those not cut off as pounds, and those cut off, divided by 5 give the shillings.

EXAMPLES.

DIVIDE *L.* 1495 by 100.

$$14|95 = L.14.19. \text{ Ans.}$$

Thus, 100 into 1495 goes 14 times, the 95 left is usually multiplied by 20, and the product again divided by 100 to give the shillings, but we divide the shillings cut off by 5, because 20 into 100, goes 5 times.

Divide *L.* 1|65 by 100. *Ans.* *L.* 1.13.

Note, If there are any pounds remaining after dividing by 5, annex a cipher, and consider them as farthings, observing to reject 1 at 25.

Divide *L.* 19|82 by 100. *Ans.* *L.* 19.16.4 $\frac{3}{4}$.

Thus, the 19 cut off are pounds; 5 into 82 went 16 times, leaving 2, with a cipher, made 20, rejecting 1 left 19 farthings or 4 $\frac{3}{4}$ *d.*

Divide *L.* 4|43 by 100. *Ans.* *L.* 4.8.7.

If there should be any shillings, instead of adding a cipher, add half the shillings, and proceed as before.

Divide *L.* 34|53.18 by 100. *Ans.* *L.* 34.10.9 $\frac{1}{2}$.

Thus, the 3 left by adding 9 ($\frac{1}{2}$ the 18s.) gave 39 farthings, one rejected left 38 farthings, or 9 $\frac{1}{2}$ *d.*

The above will be sufficient, as Examples are capable of being multiplied to any extent.

RULE to divide *L. s. d.* by 200, in a line of figures, or at a glance.—Cut off the unit figure of the pounds, consider those not cut off as shillings, the unit figure cut off consider as pence, and as many fifths; for 4 or 5 in the shillings, allow $\frac{1}{4}$ *d.* for 8 or 10 allow $\frac{1}{2}$ *d.* for 13 or 15 allow $\frac{3}{4}$ *d.* and for 16s. 3*d.* or upwards, allow a penny.

Note, The same operation is performed in calculating interest at *L.* 6 per cent., and discount, &c at $\frac{1}{2}$ per cent., see page 47.

EXAMPLES.

DIVIDE £10 by 200. *Ans.* 1s.

As by the Rule the unit figure is cut off, and those not cut off are shillings.

Divide £142 by 200.
14|2 *Ans.* 14s. 2 $\frac{2}{5}$ d.

As by the Rule, the unit figure is to be considered as pence, and as many fifths.

What is the price of one silk shawl, if 200 cost £260 12 6.

Here the cipher is cut off, leaving 26|0 equal to £1.6. the cipher is pence, and for 12s. 6d. $\frac{2}{4}$ d. are allowed. see Rule. *Ans.* £1.6.0 $\frac{3}{4}$ d. each.

What will 1 *cut.* of iron cost, if for 200 *cut.* are paid £385.4.3 $\frac{1}{4}$. *Ans.* £1.18.6 $\frac{1}{4}$. see Rule.

Note, The cause of the above is explained on page 70, see Interest, Commission, or Discount, at $\frac{1}{2}$ per cent.

The same method can be applied to dividing by any number of hundreds, by subdividing the Answers produced by this plan.

The very great use of a Table for calculating the Wages of Servants, &c. is the only apology necessary for so far deviating from our plan as to introduce any thing into our work in the shape of a Table, that can be arrived at, by a short and simple operation.

A TABLE OF WAGES.

Showing what any sum from £2 to £30 per annum, is per calendar month, week, or day.

<i>Year.</i>	<i>Month.</i>	<i>Week.</i>	<i>Day.</i>
£ s. d.	£ s. d.	£ s. d.	£ s. d.
2 0 0	0 3 4	0 0 9 $\frac{1}{2}$	0 0 1 $\frac{1}{4}$
2 2 0	0 3 6	0 0 9 $\frac{3}{4}$	0 0 1 $\frac{1}{4}$
2 5 0	0 3 9	0 0 10 $\frac{1}{4}$	0 0 1 $\frac{1}{2}$
2 10 0	0 4 2	0 0 11 $\frac{1}{2}$	0 0 1 $\frac{3}{4}$
2 12 6	0 4 4 $\frac{1}{2}$	0 1 0	0 0 1 $\frac{3}{4}$
2 15 0	0 4 7	0 1 0 $\frac{3}{4}$	0 0 1 $\frac{3}{4}$
3 0 0	0 5 0	0 1 2	0 0 2
3 3 0	0 5 3	0 1 2 $\frac{1}{2}$	0 0 2
3 5 0	0 5 5	0 1 3	0 0 2
3 10 0	0 5 10	0 1 4	0 0 2 $\frac{1}{4}$
3 13 6	0 6 1 $\frac{1}{2}$	0 1 5	0 0 2 $\frac{1}{2}$
3 15 0	0 6 3	0 1 5 $\frac{1}{2}$	0 0 2 $\frac{1}{2}$
4 0 0	0 6 8	0 1 6 $\frac{1}{2}$	0 0 2 $\frac{1}{2}$
4 4 0	0 7 0	0 1 7 $\frac{1}{2}$	0 0 2 $\frac{3}{4}$
4 10 0	0 7 6	0 1 9	0 0 3
4 15 0	0 7 11	0 1 9 $\frac{1}{2}$	0 0 3
5 0 0	0 8 4	0 1 11	0 0 3 $\frac{1}{4}$
5 5 0	0 8 9	0 2 0 $\frac{1}{4}$	0 0 3 $\frac{1}{2}$
5 10 0	0 9 2	0 2 1 $\frac{1}{2}$	0 0 3 $\frac{1}{2}$

Year.			Month.			Week.			Day.		
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
5	15	6	0	9	7½	0	2	2¾	0	0	3¼
6	0	0	0	10	0	0	2	3¾	0	0	4
6	6	0	0	10	6	0	2	5	0	0	4
6	10	0	0	10	10	0	2	6	0	0	4½
6	16	6	0	11	4½	0	2	7½	0	0	4½
7	0	0	0	11	8	0	2	8½	0	0	4½
7	5	0	0	12	1	0	2	9¼	0	0	4¾
7	7	0	0	12	3	0	2	10	0	0	4¾
7	10	0	0	12	6	0	2	10½	0	0	5
7	17	6	0	13	1½	0	3	0¼	0	0	5¼
8	0	0	0	13	4	0	3	1	0	0	5¼
8	5	0	0	13	9	0	3	2	0	0	5½
8	8	0	0	14	0	0	3	2¾	0	0	5½
8	15	0	0	14	7	0	3	4½	0	0	5¾
8	18	6	0	14	10½	0	3	5¼	0	0	5¾
9	0	0	0	15	0	0	3	5½	0	0	6
9	5	0	0	15	5	0	3	6¾	0	0	6
9	9	0	0	15	9	0	3	7½	0	0	6¼
9	15	0	0	16	3	0	3	9	0	0	6½
10	0	0	0	16	8	0	3	10	0	0	6½
10	5	0	0	17	1	0	3	11¼	0	0	6¾
10	10	0	0	17	6	0	4	0½	0	0	7
10	15	0	0	17	11	0	4	1¾	0	0	7
11	0	0	0	18	4	0	4	3	0	0	7¼
11	11	0	0	19	3	0	4	5¼	0	0	7½
12	0	0	1	0	0	0	4	7½	0	0	8
12	10	0	1	0	10	0	4	9½	0	0	8¼
12	12	0	1	1	0	0	4	10	0	0	8¼
13	0	0	1	1	8	0	5	0	0	0	8½
13	10	0	1	2	6	0	5	2¼	0	0	8¾
13	13	0	1	2	9	0	5	3	0	0	9
14	0	0	1	3	4	0	5	4½	0	0	9¼
14	14	0	1	4	6	0	5	8	0	0	9¾
15	0	0	1	5	0	0	5	9	0	0	10
15	10	0	1	5	10	0	5	11¾	0	0	10¼
15	15	0	1	6	3	0	6	0½	0	0	10½
16	0	0	1	6	8	0	6	2	0	0	10½
16	10	0	1	7	6	0	6	4	0	0	11
16	16	0	1	8	0	0	6	5½	0	0	11
17	0	0	1	8	4	0	6	6½	0	0	11¼
17	10	0	1	9	2	0	6	8¾	0	0	11½
17	17	0	1	9	9	0	6	10½	0	0	11¾
18	0	0	1	10	0	0	6	11	0	0	11¾
18	10	0	1	10	10	0	7	1¼	0	1	0¼
18	18	0	1	11	6	0	7	3	0	1	0¼
19	0	0	1	11	8	0	7	3½	0	1	0½
19	10	0	1	12	6	0	7	5½	0	1	0¾
19	19	0	1	13	3	0	7	8	0	1	1
20	0	0	1	13	4	0	7	8	0	1	1¼
21	0	0	1	15	0	0	8	0¾	0	1	1½
22	0	0	1	16	8	0	8	5¾	0	1	2¼
23	0	0	1	18	4	0	8	10	0	1	3
24	0	0	2	0	0	0	9	2¾	0	1	3¾
25	0	0	2	1	8	0	9	7½	0	1	4½

NOVEL SYSTEM

<i>Year.</i>			<i>Month.</i>			<i>Week.</i>			<i>Day.</i>		
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
25	4	0	2	2	0	0	9	8½	0	1	4½
26	0	0	2	3	4	0	10	0	0	1	5
26	10	0	2	4	2	0	10	2½	0	1	5½
27	0	0	2	5	0	0	10	4½	0	1	6½
28	0	0	2	6	8	0	10	9	0	1	6½
29	0	0	2	8	4	0	11	1½	0	1	7
30	0	0	2	10	0	0	11	6½	0	1	7½

Note, As the exact sum per day or week cannot be arrived at without introducing a useless fraction, we have given the price per day the advantage of the fraction in some instances.

FROM RICHSON'S
MENTAL ARITHMETIC,
 AND
 EXPEDITIOUS CALCULATIONS.

EXERCISE I.

- How many twelves in 84?
- How many twelves in 24?
- How many twelves in 60?
- How many twelves in 108
- How many twelves in 144
- How many twelves in 36?
- How many twelves in 48?
- How many twelves in 72?
- How many twelves in 120
- How many twelves in 96?

EXERCISE II.

RULE.

As many *pence* as *one* thing is worth—
 so many *shillings* are *twelve* worth.

12 papers of nails at 8d. each.

ONE paper being worth.....8 PENCE,
 12 papers are worth.....8 SHILLINGS.

12 pounds of wax candles at 2s. 7d. per pound.

ONE pound being worth 2s. 7d., that is ..31 PENCE,
 12 pounds are worth.....31 SHILLINGS.

- 12 yards of cotton print at 6*d.* per yard?
 12 yards of riband at 11*d.* per yard?
 12 yards of Holland at 10*d.* per yard?
 12 yards of calico at 4*d.* per yard?
 12 yards of baize at 14*d.* per yard?
 12 yards of long-cloth at 1*s.* 2*d.* per yard?
 12 lbs. of butter at 16*d.* per pound?
 12 pairs of gloves at 1*s.* 4*d.* per pair?
 12 bushels of pollard at 20*d.* per bushel?
 12 logs of wood at 1*s.* 8*d.* per log?
 12 fowls at 30*d.* each?
 12 books at 2*s.* 6*d.* each?
 12 pairs of shoes at 5*s.* per pair?
 12 pairs of children's socks at 1*s.* 3*d.* per pair?
 12 caps at 3*s.* 6*d.* each?
 12 lbs. of cheese at 10*d.* per pound?
 12 pecks of peas at 1*s.* 5*d.* per peck?
 12 lbs. of salmon at 1*s.* 11*d.* per pound?
 12 yards of red baize at 2*s.* 2*d.* per yard?
 12 trusses of hay at 4*s.* 4*d.* per truss?
 12 trusses of straw at 3*s.* 8*d.* per truss?
 12 gallons of ginger wine at 8*s.* per gallon?
 12 firkins of table ale at 9*s.* 6*d.* per firkin?

I have bought 12 pigeons at 1*s.* 3*d.* each; the bill delivered is 16*s.* 3*d.*; is that correct?

I wish to know how much money I need put into my purse to purchase a dozen buckles at 4*s.* 9*d.* each?

I see the price of a flannel waistcoat is marked 2*s.* 9*d.*, what should I pay for 12?

Sent half a sovereign to purchase a leg of mutton weighing 12 pounds, at 8*d.* per pound, how much change should I have?

The baker's bill this week includes 12 peck loaves, at 2*s.* 8*d.* each. He has made the amount £1 11*s.* 6*d.* is that correct?

Employed a man in my garden 12 days at 3s. 6d. per day, how much must I pay him?

Saw 12 turkeys hanging in a poulterer's shop, how much would be their worth supposing they average 9s. 6d. each?

EXERCISE III.

RULE.

As many *shillings* as *twelve* articles are worth—
so many *pence* is *one* worth.

Bought 12 newspapers for 7s., how much was that EACH?

12 papers being worth..... 7 SHILLINGS,

1 paper will be worth..... 7 PENCE.

If I pay 8s. for 12 pigeons, how much will one cost?

Suppose 12 maps cost 16s., what was the charge for one?

For how much may I purchase a mackarel, when a dozen are worth 7s.?

If 12 pairs of shoes cost 48s., what was that per pair?

What must I pay for a bible, when 12 are sold for 50s.?

Bought 12 gallons of cider for a pound, how much is that per gallon?

Received 3s. for a dozen glass bottles, how much was that for each?

Paid £1 10s. for a dozen guitar strings, what was that for each?

Gave £2 14s. for 12 pine-apples, how much was the cost of one?

A dozen barrels of oysters cost £3, how much was that for one?

12 geese cost £3 12s., what was the price of one?

12 ducks were bought for £1 6s., what was the charge for one?

Paid £6 for a dozen hats, how much is that each?

If I pay 10s. for 12 yards of Holland, what is that per yard?

A dozen rose-trees were bought for two guineas, how much did each cost?

If I am charged 5s. for a foot of gilding, what is the estimation per inch?

A dozen lamps are worth £3 10s., what is the value of one?

If I pay £1 19s. for 12 stocks, how much is that each?

How much must I pay for a pair of silk stockings, when a dozen pairs are sold for £3 14s.

What should I be charged for a silk handkerchief, when twelve are worth £2 16s.?

Suppose 12 loads of gravel cost £7 4s., what is that per load?

Bought 12 caps for £1 7s., what was the charge for one?

Tell me the value of a pound of mutton, when a leg weighing 12 lb. cost 9s.?

Suppose 12 blinds were estimated at £4 18s., what was considered the value of one?

Bought 12 curtains for £3 19s., how much was paid for one?

Sold 12 baskets for £1 15s. how much was charged for each?

EXERCISE IV.

To find the price of *one* article, when the value is known of any number, which is a *multiple* of 12.

 RULE.

1. Ascertain how many twelves are in the number of articles.
2. Bring the value into shillings, and *divide* it by the *number* of twelves.
3. Call the result *pence*.

THUS,

If 72 wine-glasses cost £2 8s., what is the value of one?

72 equals 6 times 12,

Therefore the £2 8s. or 48s. must be divided }
by the 6..... } 6)48s.

Take the 8s. as PENCE, you have the answer. 8d.

If a gross of papers of pins be bought for 4 guineas, what was the charge per paper?

A gross equals 12 times 12,

Therefore the 4 guineas or 84s. must be }
divided by 12..... } 12)84s.

Consider the 7s. to be 7 PENCE, you have }
the answer } 7d.

Paid £1 4s. for 48 pairs of scissors, how much was that per pair?

A fishmonger paid £3 6s for 72 lobsters, what did that cost him each?

If 84 bodkin-cases are worth £1 15s., what is the value of one?

If a news-vender demands 36s. for the use of a daily paper six months, how much does he charge per week?

Paid 12s. for a box of mould candles; there were 18 pounds, and four candles to the pound; what was the value of one?

For 48 chair-covers I paid £1 16s., I desire to know the cost of each?

Bought half a gross of wine-bottles for 18s. what was that each?

Paid £7 10s. for 60 brass finger-plates, I wish to know the charge for one?

For 120 flower-pots I paid £2, what did one cost?

Bought 36 work-boxes for £13 10s., what is the cost of each?

Sold 132 old books for £4 19s., what did they average each?

Bought a dinner service of 108 pieces, for which I paid £2 5s., how much was that per piece?

A violent shower of hail destroyed 96 glass frames, the estimated damage was £48 8s., how much was that per frame?

At Christmas last a stage-coach brought into London 84 packages, valued at £23 2s., I desire to know the average?

A stand of 72 flowers in Covent-garden market was estimated at £16 10s., I wish to know the average?

If I pay one of my servants after the rate of £10 per annum, and she quit my establishment at the end of one month, how much may she demand?

Suppose an under-gardener is paid after the rate of £14 per annum; if he leave his situation at the end of two months, what wages are due to him?

What may a footman demand as a month's wages when his salary is £20 per annum?

If a butler's wages be £34 a-year, how much will be due to him at the end of a month?

EXERCISE V.

The value of any number of articles, not an exact multiple of 12, being given; to find the value of *one*.



RULE.

- 1 Reckon the *number* of articles *pence*.
2. If these pence amount to shillings and pence, divide the *shillings* of the *given value* by the shillings; and the *pence* also by the pence.
3. If both the *pence* and shillings give the same product, *that number* is the value of *one* article in *pence*.

THUS,

If 85 lamp-glasses be bought for £2 9s. 7d., what is the cost of one?

Take the glasses as PENCE, then 85d. are 7s. 1d. * }
 £2 9s. 7d. are 49s. 7d. }

Divide the 49s. by the 7s.

Divide the 7d. by the 1d. as follows:—

$$\begin{array}{r} 7 \overline{)49} \\ \underline{7} \\ 7 \end{array} \qquad \begin{array}{r} 1 \overline{)7} \\ \underline{7} \\ 0 \end{array}$$

Here observe the product of both divisions is 7, therefore the value of ONE lamp-glass is 7d.



Purchased 107 pieces of painted glass for £4 0s. 3d., what was the cost of one?

The pieces as pence 107d. are 8s. 11d. }
 £4 0s. 3d. are 80s. 3d. }
 8s. 11d.)80s. 3d.

9s. 9d. Therefore 9d. is the value of one.

* Inspection of the above, where the amounts are placed over one another, renders the calculation unnecessary, as it can be seen at once that 7 is the product of both.

Remark here that the EIGHTS in 80 are exactly 10; but then the 11 could not be divided into 3. I am therefore obliged to make the PRODUCT of the first division ONE LESS, in order to carry the surplus shillings to the pence and produce a number, into which 11 may divide.

Bought at a sale a lot of tumblers, for which I paid £1 18s. 6d. On counting them I discovered there were 42 glasses, what did each cost?

$$\begin{array}{r}
 42d. \text{ are } 3s. 6d. \} \\
 \text{£1 } 18s. 6d. \text{ are } 38s. 6d. \} \\
 3s. 6d.) 38s. 6d. \\
 \hline
 11 \quad 11 \quad \text{Therefore } 11d. \text{ each}
 \end{array}$$

I am here also obliged to reduce the product of the first division—otherwise

Dividing by 3 into 38 would produce 12s. and two over.

The division of 6 into 2s. 6d. or 30d. would produce 5d.

But as both shillings and pence must produce the *same number* to be correct, this can be effected only by the reduction just stated.

Observe,

By a little attention, the value of *one* article may be nearly ascertained on inspection.

THUS,

If 42 tumblers be bought for £ 1 18s. 6d., what is the price of one?

$$\begin{array}{r}
 42d. \text{ or } \dots\dots\dots 3s. 6d. \mid 38s. 6d. \\
 \phantom{42d. \text{ or } \dots\dots\dots} 11 \\
 \hline
 38s. 6d.
 \end{array}$$

By inspection I see the 3s. is contained 12 times in 38.

But making allowance for the division of the six pence, I take 11 as the supposed quotient.

Multiplying the 3s. 6d. by 11, I find it produces 38s. 6d., therefore I know that 11d. is the value of one article.

How much was paid for a sheet of card board, when 61 were bought for £1 0s. 4d.?

If I purchase 93 lemons for £1 4s. 6d., what do I pay for one?

Paid £2 5s. 5d. for 109 knives, what was the cost of one?

If I pay 8s. 4d. for 50 flower-pots, how much does one cost?

Suppose 97 hand screens cost £3 12s. 9d., how much was that each?

If £1 13s. 11d. will purchase 37 drawing copies, how much must I pay for one?

What is the worth of a square of glass for a hot-house supposing 63 cost 15s. 9d.?

How much must be paid for a turkey's egg, when £1. 0s. 10d. will buy 50?

I wish to know the cost of a rabbit when I pay £1. 13s. 11d. for 37?

Paid 13s. 6d. for 27 yards of box, what was that per yard?

A bill for 53 quarts of milk is 19s. 4d., what is that per quart?

How much am I charged per ton for cartage if the carriage of 107 tons of stone cost £3. 2s. 5d.?

Suppose a man contract to lay 91 feet of railway for £3. 0s. 8d., how much is that per foot?

What do I pay for a gooseberry-bush if 115 cost me £4 15s. 10d.?

If 83 pickled tongues cost £3 2s. 3d., how much is that each?

EXERCISE VI.

To find the value of *one* article, when the price is known of any number, not a multiple of 12. '
 ———

RULE.

1. Take the *number of articles* as pence, and bring them into shillings for a divisor.
2. If the divisor, thus produced, be contained any number of times *less than 12*, in the shillings of the given value, proceed as directed in the *Observation* under *Exercise V.*, and you have the answer in *pence*.

Remark,

If the multiplier do not produce the exact amount, Consider, for a moment, whether it is deficient about *a quarter, a half, or three quarters* of the line multiplied, and make an addition accordingly for the *farthings*.

THUS,

If 17s. 2½d. will purchase 59 pounds of brass, how much is that per pound?

$$\begin{array}{r}
 59d. = 4s. 11d. \quad) \quad 17s. 2\frac{1}{2}d. \\
 \underline{\quad\quad\quad 3} \quad \left\{ \begin{array}{l} \text{the multiplier to be counted} \\ \text{pence in the answer.} \end{array} \right. \\
 \quad\quad\quad 14 \quad 9 \\
 \frac{1}{2} \text{ of } 4s. 11d. \dots 2 \quad 5\frac{1}{2} \\
 \underline{\quad\quad\quad 17 \quad 2\frac{1}{2}} \quad \text{Ans. } 3\frac{1}{2}d.
 \end{array}$$

In this example, I first write the number of articles, taken as pence, by the side of the given value.

On inspection, I perceive 4s. will divide 4 times into 17s.; but allowing for the division by 11d., I take 3 instead and multiply thereby.

The advantage of this method is, that by comparing 2s. 5½*d.* with 4s. 11*d.*, I see immediately the former is ½ of the latter.

The operation may therefore be performed mentally, when requisite—or if by written figures, with greater certainty.

$$\begin{array}{r}
 8s. \ 11d. \quad) \ 51s. \ 3\frac{1}{4}d. \\
 \underline{\quad 5 \quad} \quad \quad \quad \underline{\quad 44 \ 7 \quad} \\
 44 \ 7 \quad \quad \quad \quad \quad \quad \underline{\quad 6 \ 8\frac{1}{4} \quad}
 \end{array}$$

Here I can see that 6s. 8¼*d.* must be about ¾ of 8s. 11*d.*—as it is evidently more than ½.

To satisfy myself I take the *half* of 8s. 11*d.*,

which is..... 4s. 5½*d.*

And again the *half* of that amount, viz.... 2 2¾

Producing together the required sum 6 8¼

Observe,

If the *number of articles* be less than the number of shillings in the given value,

First, divide into the *shillings* by the *whole number* of articles—the quotient is the *shillings* of the answer.

Then proceed with the remainder, as directed under the last rule, and you have the remaining answer in *pence* and *farthings*.

THUS,

If 76 packing-cases cost £9 8s. 5*d.*, how much was paid for ONE?

$$76)188s. \ 5d. \ \text{or} \ \text{£}9 \ 8s. \ 5d. \ (2s. \ 5\frac{3}{4}d.$$

152

$$76 \text{ as pence} = 6s. \ 4d.) \ \begin{array}{r} 36 \ 5 \\ \underline{\quad 31 \ 8} \\ 4 \ 9 \end{array} \quad (5\frac{3}{4}d.$$

$\left. \begin{array}{r} \frac{1}{2} \ 3 \ 2 \\ \frac{1}{4} \ 1 \ 7 \\ \hline 4 \ 9 \end{array} \right\} \text{I can readily suppose } 4s. \ 9d. \text{ to be about } \frac{2}{3} \text{ of } 5s. \ 6d., \text{ but merely put down the work for satisfaction.}$

Here 188s. are evidently more than the *number* of articles, which is 76.

I therefore divide by 76 for the shillings—the quotient is 2s.

Subtracting 152 from 188, I have 36 remainder.

Bringing down the 5*d.*, and reducing 76, as *pence*, into its corresponding value in shillings, I proceed as before for the *pence and farthings*.

Bought 54 breast-pins for £8 12s. 1½*d.*, how much did each cost?

$$\begin{array}{r}
 54) 172s. 1\frac{1}{2}d., \text{ or } \text{£}8\ 12s. 1\frac{1}{2}d. \text{ (} 3s. 2\frac{1}{4}d. \\
 \underline{162} \\
 54d. \text{ or } 4s. 6d) \quad 10 \quad 1\frac{1}{2} \quad (2\frac{1}{4} \\
 \quad \quad \quad \quad \quad 9 \quad 0 \\
 \hline
 \quad \quad \quad \quad \quad 1 \quad 1\frac{1}{2}
 \end{array}$$

$\frac{1}{4} \left| \begin{array}{r} 4 \quad 6 \\ \hline 1 \quad 1\frac{1}{2} \end{array} \right\}$ I put this division down only for satisfaction, as I can immediately perceive 1s. 1½*d.* is $\frac{1}{4}$ of 4s. 6*d.*

Dividing by 54, the *number of articles*, I find the shillings are 3.

The remainder 10s. 1½*d.*, divided by 54, as *pence*, produce the *pence and farthings*.

If 47 pounds of sugar be worth £1 1s. 6½*d.*, what is the value of a pound?

Suppose I am charged £1 2s. 2½*d.* for 82 ounces of ginger, how much is that per ounce?

If 13s. 0¼*d.* will buy 25 pounds of figs, how much must be paid for 1 pound?

If a grocer import 62 pounds of Portugal grapes, and the net invoice amount to £2 14s. 3*d.*, what is the cost of a pound?

If 12s. 9¾*d.* will purchase 41 pen-holders, how much would one cost at the same rate?

If I order 37 pounds of currants and find my bill amounts to £1 6s. $2\frac{1}{2}d.$, how much am I charged per pound?

If a hosier desire to sell 71 pairs of gloves for £2 17s. $3\frac{1}{4}d.$, how much must be charged per pair?

What is the worth of a pound of loaf sugar, if 49 pounds cost £2 0s. $10d.$

Paid £1 1s. $3\frac{3}{4}d.$ for 31 drawing-pencils, how much was that each?

If I may purchase 68 pounds of cheese for £2 12s. $5d.$, how much would that be per pound?

Bought a quantity of hams weighing 73 pounds, I am charged for the whole £2 7s. $1\frac{3}{4}d.$, I desire to know the cost per pound?

Bought 30 pounds of fresh butter for £1 15s. $7\frac{1}{2}d.$, how much is that per pound?

How much is the worth of a pound of Normandy pippins, if £1 6s. $8d.$ be paid for 40 pounds?

Paid £1 4s. $0\frac{3}{4}d.$ for 21 pounds of cocoa, what is the cost of a pound?

At what rate per pound do I purchase coffee, when 75 pounds cost £8 4s. $0\frac{3}{4}d.$

If £11 17s. $6d.$ will purchase 57 silk handkerchiefs, what is the price of one?

What must I pay for a hone supposing 55 are worth £1 17s. $4\frac{3}{4}d.$?

If 46 pounds of lard cost £1 16s. $5d.$, how much would that be per pound?

Suppose £8 17s. $4\frac{1}{2}d.$ will purchase 66 pocket-handkerchiefs, how much must I pay for one?

At what rate per pound do I purchase glue, if for 32 pounds I pay 18s.

If a boat of salmon, containing 101 fish, be valued at £6 2s. $0\frac{1}{2}d.$, what is that each?

If a grocer wish to obtain £6 6s. $2\frac{1}{4}d.$ for 83 pounds of candied lemon-peel, how much must he charge per pound?

What am I charged for a pane of glass, if the cost of 41 panes be £6 2s. 1 $\frac{3}{4}$ d.?

For how much per pound should a pork-butcher sell sausages to realize £2 3s. 0 $\frac{1}{4}$ d. by 59 pounds?

If, at an auction, I bid £6 7s. 10 $\frac{1}{2}$ d. for 93 padlocks, what would be the individual cost?

What is stone-blue per pound, if 126 pounds are bought for £15 17s. 7 $\frac{1}{2}$ d.

How much is a hammer worth, if for £3 16s. 4 $\frac{1}{2}$ d. I can buy 78?

Taking the value of a silk stock at 4s, I wish to know how much I have saved individually by purchasing 63 stocks for £9 15s. 6 $\frac{3}{4}$ d.?

If a poulterer purchase 80 pigeons for £2 10s., how much does he gain individually by selling them at 8d. each?

What does a work-box cost if £12 4s. 8 $\frac{1}{4}$ d. be paid for 81?

Bought 29 dozen of ivory counters for 16s. 3 $\frac{3}{4}$ d., how much was that per dozen?

If a chest of hyson tea, containing 107 pounds, be sold for £37 17s. 11d., how much is that per pound?

Suppose a cabinet-maker charge £11 1s. 4d. for 64 foot-stools, how much is that each?

If a pedlar buy 118 shaving-boxes for £5 10s. 7 $\frac{1}{2}$ d. and sell them at 1s. per box, what is the gain on each?

How much does a bird-trap cost if £3 19s. 6 $\frac{1}{2}$ d. be paid for 46?

For how much may I buy a half-pint mug, if 54 are worth 15s. 9d.?

Paid £10 16s. 11d. for 76 cigar-cases, how much was that each?

What is the cost of a peck of oats, if £4 11s. 0 $\frac{1}{2}$ d. be paid for 95 pecks?

What are slippers per pair, when 86 pairs cost £8 12s.?

When the value of 44 trusses of hay is £8 17s. 10d., how much is the worth of a truss?

If 39 sheets of engraved "lines" cost 13s. 9 $\frac{3}{4}$ d., what is that per sheet?

If an iron-monger purchase 74 rakes for £6 15s. 8d. and sell them again for 2s. each, how much is the individual gain?

What is a publican's profit on a quart of vinegar, supposing he sells that quantity for 1s., when 110 quarts cost him £4 9s. 4 $\frac{1}{2}$ d.?

If £13 6s. 6d. be paid for 52 pounds of mixed tea, how much is that per pound?

What are almonds per pound, if £3 1s. 2 $\frac{1}{2}$ d. are paid for 26 pounds?

If I pay £3 3s. 3 $\frac{1}{2}$ d. for 98 pounds of soap, how much is that per pound?

If a milliner pay £7 5s. 10d. for 70 yards of silk, how much is she charged per yard?

What is beef per pound, if 113 pounds are worth £3 1s. 2 $\frac{1}{2}$ d.

THE END.

