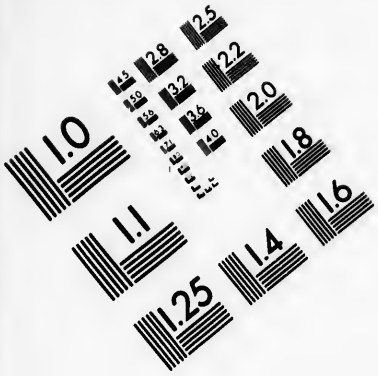

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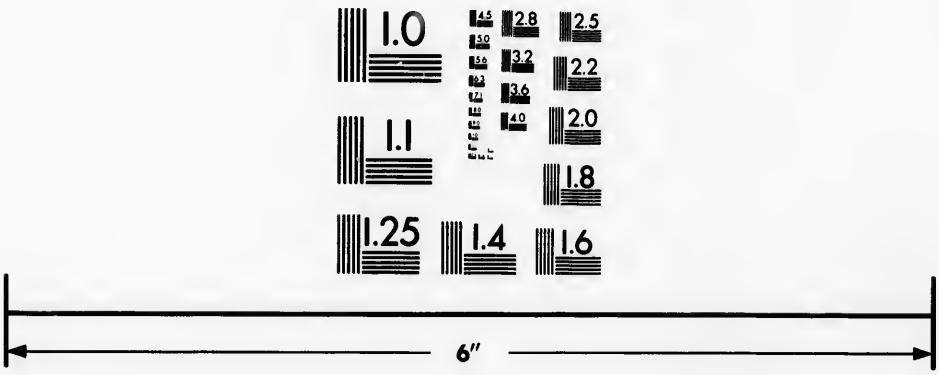

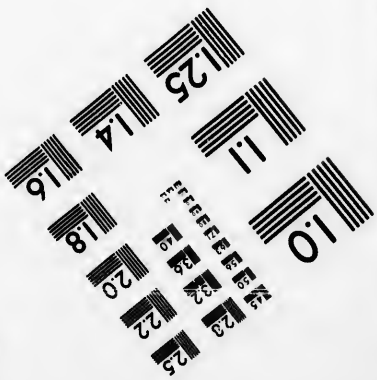

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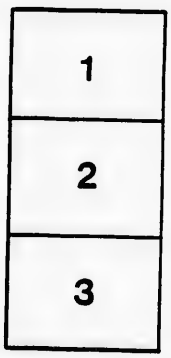

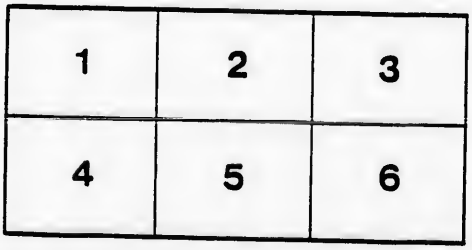

2303. Willcotke's

WILLCOLKES'S AND FRYER'S

NEW AND MUCH ADMIRED SYSTEM

OF

ARITHMETIC

AND

MENTAL CALCULATIONS.

REPRINTED FOR THE USE OF THE CENTRAL ACADEMY, CHARLOTTETOWN, FROM THE FOURTH ENGLISH EDITION, AND ENLARGED BY SEVERAL VALUABLE 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

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PRINCE EDWARD ISLAND:

PRINTED AND PUBLISHED BY JAMES DOUGLAS HAZZARD.

1837.

To ... *Major-General Sir JOHN HARVEY, K. C. H & C. B. Lieutenant Governor and Commander 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 WADDELL.

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. Haszard'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 develope 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.

Units	1
Tens	12
Hundreds	123
Thousands	1,234
Tens of Thousands	12,345
C. of Thousands	123,456
Millions	1;234,567
X. of Millions	12;345,678
C. of Millions	123;456,789

CURRENT MONEY.

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

PENCE.

d.	*s.* *d.*
20 are	1 8
24 ‘	2 0
30 ‘	2 6
36 ‘	3 0
40 ‘	3 4
48 ‘	4 0
50 ‘	4 2
60 ‘	5 0
70 ‘	5 10
72 ‘	6 0
80 ‘	6 8
84 ‘	7 0
90 ‘	7 6
96 ‘	8 0
100	8 4
108	9 0
120 ‘	10 0

SHILLINGS.

s	£. *s.*
20 are	1 0
30 ‘	1 10
40 ‘	2 0
50 ‘	2 10
60 ‘	3 0
70 ‘	3 10
80 ‘	4 0
90 ‘	4 10
100 ‘	5 0
110 ‘	5 10
120 ‘	6 0
130 ‘	6 10
140 ‘	7 0
150 ‘	7 10
160 ‘	8 0
170 ‘	8 10
180 ‘	9 0

Tables of Weights and Measures.

PRACTICE.

OF A POUND, OR SOVEREIGN.

s.	*d.*	£.
10	0 are	1 half
6	8 ‘	1 third
5	0 ‘	1 fourth
4	0 ‘	1 fifth
3	4 ‘	1 sixth
2	6 ‘	1 eighth
2	0 ‘	1 tenth
1	8 ‘	1 twelfth
1	4 ‘	1 fifteenth
1	3 ‘	1 sixteenth
1	0 ‘	1 twentieth

OF A SHILLING.

d.	*s.*
6 are	1 half
4 ‘	1 third
3 ‘	1 fourth
2 ‘	1 sixth
1½ is	1 eighth
1 ‘	1 twelfth

OF A PENNY.

farth.	*d.*
2 are	1 half
1 is	1 fourth.

OF A TON.

Cwt.	*T.*
10 are	1 half
5 ‘	1 fourth
4 ‘	1 fifth
2½ ‘	1 eighth
2 ‘	1 tenth
1 is	1 twentieth

OF A HUNDRED.

qr.	*lb.*	*Cwt.*
2	0 are	1 half
1	0 is	1 fourth
0	16 are	1 seventh
0	14 ‘	1 eighth

TROY.

24 gr. make 1 dwt.
20 dwt. ... 1 ounce
12 oz. ... 1 pound

AVOIRDUPOIS.

16 dr. make 1 oz.
16 oz. ‘ 1 lb.
14 lb. ‘ 1 stone
28 lb. ‘ 1 quarter
4 qr. ‘ 1 cwt.
20 cwt. ‘ 1 ton.

APOTHECARIES'.

20 gr. make 1 scruple
3 scr. .... 1 dram
8 dr. .... 1 ounce
12 oz. .... 1 pound

ALE AND BEER.

2 pints make 1 quart
4 quarts ... 1 gallon
9 gallons ... 1 firkin
2 firkins ... 1 kilder.
2 kilderkins 1 barrel
1½ barrels ... 1 hhd.
2 barrels ... 1 pun.
3 barrels ... 1 butt.

SOLID MEASURE.

1728 inches 1 solid foot
27 feet... 1 yard

WINE.

2 pints make 1 quart
4 quarts ... 1 gallon
10 gallons ... 1 anker
42 gallons ... 1 tierce
63 gallons ... 1 hhd.
2 hhd. ... 1 pipe
2 pipes ... 1 tun

LONG MEASURE.

3 barley-corns 1 inch
12 inches .... 1 foot
3 feet .... 1 yard
6 feet .... 1 fathm.
5½ yards .... 1 pole
40 poles .... 1 fur.
8 furlongs .... 1 mile
3 miles .... 1 league
69½ miles .... 1 degree

LAND MEASURE.

9 feet make 1 yard
30¼ yards ... 1 pole
40 poles ... 1 rood
4 roods ... 1 acre

CLOTH MEASURE.

2¼ inch. make 1 nail
4 nails .... 1 quar.
3 qrs. .... 1 Fl.ell.
4 qrs. .... 1 yard
5 qrs. .... 1 En.ell.

TIME.

60 sec. ... 1 minute
60 min. ... 1 hour
24 hours ... 1 day
7 days ... 1 week
4 weeks... 1 month

ENLARGED MULTIPLICATION TABLE.

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

	3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
	2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		

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 11*d.* per *lb* ?

36 at 1 penny equal to 3*s.*

multiplied by 11

£1.. 13 3*ns.*

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?

£1 · 9 · 2 at 1 penny.
10

£14 · 11 · 8 *Ans.*

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

£1 · 10 · 6 at 1 penny.
11

£16 · 15 · 6 *Ans.*

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

£2 · 6 · 8 at 1 penny.
7

£16 · 6 · 8 *Ans.*

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

£4 · 1 · 8 at 1 penny.
10

£40 · 16 · 8 *Ans.*

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

£4 · 3 · 3 at 1 penny.
9

£37 · 9 · 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?

3*s.* $6\frac{1}{2}d.$ at 1 penny.
4

s 14 · 2 *Ans.*

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

5*s.* $5\frac{1}{4}d.$ at 1 penny.
8

£2 · 3 · 6 *Ans.*

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

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

£1 · 1 · $11\frac{1}{4}$ *Ans.*

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

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

£3 · 6 · 6 *Ans.*

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

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

£4 · 13 · 9 *Ans.*

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

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

£3 · 13 · $7\frac{3}{4}$ *Ans.*

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

11*s.* $8\frac{3}{4}$*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 = 4*s.*
$7\frac{1}{4}$

£1 · 9 · 0 *Ans.*

Here we multiply the 4*s.* (what it comes to at 1*d.*) by 7, and add in the quarter of 4*s.* 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 = 5*s.*
$5\frac{1}{2}$

£1 · 7 · 6 *Ans.*

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

72 at 1*d.* = 6*s.*
$9\frac{3}{4}$

£2 · 18 · 6 *Ans.*

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

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

84 at 1 penny $= 7s.$

$11\frac{1}{2}$

£4 · 0 · 6 *Ans.*

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

96 at 1 penny $= 8s.$

$10\frac{3}{4}$

£4 · 6 *Ans.*

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.

£1 · 4 · 9 *Ans.*

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.

£1 · 8 · 2 *Ans.*

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

$6\frac{1}{2}$

1 · 6 · 0 at $6d.$

2 · 2 at $\frac{1}{2}d.$

£1 · 8 · 2 *Ans.*

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 $= 12s.$

$7\frac{3}{4}$

£4 · 13 · 0 *Ans.*

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.

£1 · 13 · 10 *Ans.*

What will 64 *lbs.* come to at $8\frac{3}{4}d.$ per *lb*?

64 at 1 penny $= 5s.$ $4d.$

$8\frac{3}{4}$

$s.$ to bring in

£2 · 6 · 8 *Ans.*

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

78 at 1 penny = 6*s.* 6*d.*

$10\frac{1}{4}$

1*s.* $7\frac{1}{2}$*d.* to bring in.

£3 · 6 · $7\frac{1}{2}$ *Ans.*

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

90 at 1 penny = 7*s.* 6*d.*

$11\frac{3}{4}$

5*s.* $7\frac{1}{2}$*d.* to bring in.

£1 · 3 · $1\frac{1}{2}$ *Ans.*

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

99 at 1 penny = 8*s.* 3*d.*

$8\frac{1}{2}$

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

£3 · 10 · $1\frac{1}{2}$ *Ans.*

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

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

$4\frac{1}{2}$*d.*

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

s. 18 · $11\frac{1}{4}$ *Ans.*

Or thus, in two lines:

4*s.* $2\frac{1}{2}$*d.* at 1*d.*

4

16 · 10 at 4*d.*

2 · $1\frac{1}{4}$*d* at $\frac{1}{2}$*d.*

s. 18 · $11\frac{1}{4}$ *Ans.*

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

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

$6\frac{1}{2}$

2*s.* $2\frac{3}{8}$*d.* to bring in, being the amount at $\frac{1}{2}$*d.*

£1 · 8 · $6\frac{7}{8}$ *Ans.*

Or thus:

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

$6\frac{1}{2}$

1 · 6 · $4\frac{1}{2}$ at 6*d.*

2 · $2\frac{3}{8}$ at $\frac{1}{2}$*d.*

£1 · 8 · $6\frac{7}{8}$ *Ans.*

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

5*s.* $4\frac{1}{2}$*d.*

$10\frac{3}{4}$

4*s.* $0\frac{5}{16}$*d.* at $\frac{3}{4}$*d.* to bring in

£2 · 17 · $6\frac{0}{16}$

What will $78\frac{3}{4}$ yards come to at $8\frac{3}{4}d.$ per yard?

$78\frac{3}{4}$ at 1 penny = 6*s.* $6\frac{3}{4}d.$ *s.* *d.*

8 $4 \cdot 11\frac{1}{16}$ at $\frac{3}{4}d.$ to bring in.

£2 · 17 · $5\frac{1}{16}$ *Ans.*

What will 152 yards come to at $7\frac{1}{8}d.$ per yard?

12*s.* 8*d.*

$7\frac{1}{8}$ 1*s.* 7*d.* at $\frac{1}{8}$ to bring in.

£4 . 10 · 3 *Ans.*

What will 156 yards come to at $8\frac{3}{8}d.$ per yard?

13*s.*

$8\frac{3}{8}$ 4*s.* $10\frac{1}{2}$d. at $\frac{3}{8}d.$ to bring in.

£5 · 8 · $10\frac{1}{2}$ *Ans.*

What will 168 yards come to at $9\frac{5}{8}d.$ per yard?

14*s.*

$9\frac{5}{8}$ 8*s.* 9*d.* at $\frac{5}{8}d.$ to bring in.

£6 · 14 · 9 *Ans.*

What will 360 yards come to at $10\frac{7}{8}d.$ per yard?

£1 · 10

$10\frac{7}{8}$ £1 · 6 · 3. at $\frac{7}{8}$ to bring in.

£16 · 6 · 3 *Ans.*

What will 960 gallons come to at $11\frac{1}{8}d.$ per gallon?

£4

$11\frac{1}{8}$ 10*s.* at $\frac{1}{8}d.$ to bring in.

£44 · 10 *Ans.*

What will $1212\frac{1}{2}$ yards come to at $9\frac{1}{2}d.$ per yard?

£5 · 1 · $0\frac{1}{2}$

$9\frac{1}{2}$ £2 · 10 · $6\frac{1}{4}$ at $\frac{1}{2}$ to bring in.

£47 · 19 · $10\frac{3}{4}$ *Ans.*

What will $1500\frac{1}{2}$ yards come to at $8\frac{1}{2}d.$ per yard?

£6 · 5 · $0\frac{1}{2}$

$8\frac{1}{2}$ £3 · 2 · $6\frac{1}{4}$ to bring in.

£53 · 2 · $10\frac{1}{4}$ *Ans.*

What will 1960½ yards come to at 11¼*d.* per yard?

£8 · 3 · 4½
11¼

£2 · 0 · 10⅛ to bring in.

£91 · 17 · 11⅝ *Ans.*

What will 240 yards cost at 3$\frac{1}{16}$*d.* per yard?

240 at 1*d.* per yard = £1
3$\frac{1}{16}$

£3 · 1 · 3 *Ans.*

Note, The quantity at 1*d.* per yard is found to be £1, which is multiplied by the pence of the price, and the $\frac{1}{16}$ of the price at 1*d.* being taken for the $\frac{1}{16}$.

What will 430 yards of cotton goods cost at 7$\frac{1}{16}$*d.* per yard?

£2
7$\frac{1}{16}$

7*s.* 6*d.* at $\frac{1}{16}$*d.* to bring in.

£14 · 7 · 6 *Ans.*

What will 963 yards cost at 3$\frac{13}{16}$*d.* per yard?

960 at 1*d.* = £4
3$\frac{13}{16}$

£3 · 5 to bring in.

Price of 960 *yds.* = 35 · 5
3 at 3$\frac{13}{16}$*d.* = 2 2$\frac{7}{16}$

£35 · 7 · 2$\frac{7}{16}$ *Ans.*

SECOND GENERAL RULE.

A Rule to know the Amount of any Number of *yards, ells, stones, 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 3*s.* per yard?
31 at 1 shilling = £1 · 11
multiplied by 3
£4 · 13 *Ans.*

What will 47 yards come to at 7*s.* per yard?
47 at 1 shilling = £2 · 7
7
£16 · 9 *Ans.*

What will 55 yards cost at 9*s.* per yard?
55 at 1 shilling = £2 · 15
9
£24 · 15 *Ans.*

What will 71 gallons come to at 11*s.* per gallon?
71 at 1 shilling = £3 · 11
11
£39 · 1 *Ans.*

What will 89 yards come to at 12*s.* per yard?
89 at 1*s.* = £4 · 9
12
£53 · 8 *Ans.*

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 11*s.* per gallon?
£4 · 18
11
£53 · 18 *Ans.*

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 47¼ yards cost at 5*s.* per yard?
47¼ at 1 shilling = £2 · 7 · 3
5
£11 · 16 · 3 *Ans.*

What will $69\frac{1}{2}$ yards cost at 11*s.* per yard?
$69\frac{1}{2}$ at 1 shilling = £3 . 9 . 6
11

£38 . 4 . 6 *Ans.*

What will $35\frac{3}{4}$ gallons cost at 9*s.* per gallon?
$35\frac{3}{4}$ at 1 shilling = £4 . 5 . 9
9

£38 . 11 . 9 *Ans.*

What will $111\frac{1}{4}$ *lbs.* come to at 8*s.* per *lb*?
at 1 shilling = £5 . 11 . 3
8

£14 . 10 . 0 *Ans.*

What will $1291\frac{1}{2}$ *oz.* come to at 12*s* per *oz.*?
at 1 shilling = £6 . 9 . 6
12

£77 . 14 . 0 *Ans.*

What will $185\frac{3}{4}$ *st.* come to at 7*s.* per *st.*?
at 1 shilling = £9 . 5 . 9
7

£65 . 0 . 3 *Ans.*

What will $365\frac{1}{2}$ *lbs.* come to at 13*s.* per *lb*?
$365\frac{1}{2}$ at 1 shilling = £18 . 5 . 6
13

£237 . 11 . 6 *Ans.*

What will $540\frac{3}{4}$ yards cost at 16*s.* per yard?
at 1 shilling = £27 . 0 . 9
16

£432 . 12 . 0 *Ans.*

What will $661\frac{1}{8}$ yards come to at 6*s.* per yard?
at 1 shilling = £33 . 1 . $1\frac{1}{2}$
6

£198 . 6 . 9 *Ans.*

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

What will 664$\frac{5}{8}$ gallons come to at 7*s.* per gallon ?
at 1 shilling = £ 33 · 4 · 7 $\frac{1}{2}$
7
£232 · 12 · 4$\frac{1}{2}$ *Ans.*

What will 7227$\frac{3}{8}$ yards come to at 8*s.* per yard ?
at 1 shilling = £ 36 · 2 · 10$\frac{1}{2}$
8
£289 · 3 · 0 *Ans.*

What will 80 yards come to at 4*s.* 3*d.* per yard ?
80 at 1 shilling = £4
4$\frac{1}{4}$
£17 *Ans.*

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

What will 100 gallons come to at 5*s.* 6*d.* per gallon ?
100 at 1 shilling = £5
5$\frac{1}{2}$
£27 · 10 *Ans.*

What will 120 *lbs.* come to at 6*s.* 6*d.* per *lb* ?
120 at 1 shilling = £6
6$\frac{1}{2}$
£39 *Ans.*

What will 140 yards cost at 11*s.* 6*d.* per yard ?
at 1 shillings = £ 7
11$\frac{1}{2}$
£80 · 10 *Ans.*

What will 160 *oz.* come to at 5*s.* 3*d.* per *oz.* ?
at 1 shilling = £8
5$\frac{1}{4}$
£ 42 *Ans.*

What will 180 *lbs.* cost at 12*s.* 9*d.* per *lb* ?
at 1*s.* = £9
12$\frac{3}{4}$
£114 · 15 *Ans.*
3

Here 9*d.* being the 3 quarters of a shilling. £ 6 · 15*s.* is added in, being the 3 quarters of what it comes to at 1 shilling.

What will 200 gallons come to at 4*s*. 4*d*. per gallon ?

at 1*s*. = £10 Here 4*d*. being the third of a shilling, the third of £10 is added in.

$4\frac{1}{3}$

£43 · 6 · 8 *Ans*.

What will 220 gallons come to at 11*s*. 3*d*. per gallon ?

at 1 shilling = £11 · 0

$11\frac{1}{4}$

£123 · 15 *Ans*.

What will 240 yards come to at 11*s*. 9*d*. per yard ?

240 at 1 shilling = £12

$11\frac{3}{4}$

£141 *Ans*.

What will $44\frac{1}{2}$ yards come to at 8*s*. 6*d*. per yard ?

at 1 shilling = £2 · 4 · 6 £1 · 2 · 3 to bring in.

$8\frac{1}{2}$

£18 · 18 · 3 *Ans*.

What will $69\frac{3}{4}$ yards cost at 5*s*. 6*d*. per yard ?

at 1 shilling = £3 · 9 · 9 £1 · 14 · $10\frac{1}{2}$ to bring in.

$5\frac{1}{2}$

£19 · 3 · $7\frac{1}{2}$ *Ans*.

What will $88\frac{1}{4}$ yards cost at 11*s*. 3*d*. per yard ?

at 1 shilling = £4 · 8 · 3 £1 · 2 · $0\frac{3}{4}$ to bring in.

$11\frac{1}{4}$

£49 · 12 · $9\frac{3}{4}$ *Ans*.

What will $91\frac{1}{2}$ yards cost at 7*s*. 9*d* per yard ?

at 1 shilling = £4 · 11 · 6 £3 · 8 · $7\frac{1}{2}$ to bring in

$7\frac{3}{4}$

£35 · 9 · $1\frac{1}{2}$ *Ans*

What will $125\frac{3}{4}$ gallons cost at 11*s*. 4*d*. per gallon ?

at 1*s*. = £6 · 5 · 9 £2 · 1 · 11 to bring in.

$11\frac{1}{3}$

£71 · 5 · 2 *Ans*.

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

44 at 1*s*. = £2 . 4
4 . 1
£8 . 19 . 8 *Ans.*

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

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

at 1*s*. = £3 . 6
5 . 1
£16 . 15 . 6 *Ans.*

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

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

at 1*s* = £4 . 10
6 . 2
£27 . 15 . 0 *Ans.*

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

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

at 1 shilling = £5 . 2
7 . 2
£36 . 11 . 0 *Ans.*

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

What will 112½ yards cost at 9*s*. 2*d*. per yard ?

at 1*s*. = £5 . 12 . 6
9 . 2
£51 . 11 . 3 *Ans.*

18*s*. 9*d*. to bring in.

What will 126¼ gallons cost at 12*s*. 1*d*. per gallon ?

at 1 shilling = £6 . 6 . 3
12 . 1
£76 . 5 . 6¼ *Ans.*

10*s*. 6¼*d*. to bring in

What will 43 yards cost at 5*s*. 5*d*. per yard ?

at 1*s*. = £2 . 8
5
£13 . 0 *Ans.*

4*s*. at 1 penny.
5
£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 7*s*. 7*d*. per yard ?

at 1*s*. = £3 . 12
7
£27 . 6 *Ans.*

6*s*. at 1*d*.
7
£2 . 2 to bring in.

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

at 1*s*. £4 . 4
9

£39 . 11 *Ans*.

7*s*. at 1*d*.
5

£1 . 15 to bring in.

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

at 1*s*. = £4 . 16
7

£37 . 12 *Ans*.

8*s*. at 1*d*.
10

£4 . 0 to bring in.

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

at 1*s*. = £5 . 8
9

£51 . 1 . 6 *Ans*.

9*s*. at 1*d*.
5½

£2 . 9 . 6 to bring in.

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

at 1*s*. = £6
11

£69 . 17 . 6 *Ans*.

10*s*. at 1*d*.
7¾

£3 . 17 . 6 to bring in.

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

at 1*s*. = £7 . 4
13

£100 . 1 *Ans*.

12*s*. at 1*d*.
10¾

£6 . 9 . 0 to bring in.

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

at 1*s*. = £7 . 10 . 6
5

Ans. £40 . 15 . 2½

12*s*. 6½*d*. at 1*d*.
5

£3 . 2 . 8½ to bring in.

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

at 1*s*. = £7 . 0 . 6
17 1

£120 . 0 . 2½ *Ans*.

11*s*. 8½*d*. to bring in.

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

80 at 1*s*. = £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 1*s*. which brings out the Answer in £.

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

120 at 1*s*. = £6

£138 *Ans*.

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

140 at 1*s*. = £7

£189 *Ans*.

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

160 at 1*s*. = £8

£268 *Ans*.

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

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

37*s*. 3*d*.

180 at 1*s*. = £9

£335 . 5 *Ans*.

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

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

39*s*. 4*d*.

200 at 1*s*. = £10

£393 . 6 . 8 *Ans*.

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

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 12*s*. per yard ?

123

6 equal to half of 12.

£73 . 16 *Ans*.

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 12*s*.

Suppose 147 yards at 14*s* per yard.

147
7 = ½ of 14.

£102 . 18 *Ans.*

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

347
8

£277 . 12 *Ans.*

Here the ½ 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. 12*s*.

Should the price not be even, multiply ½ the quantity by all the shillings, and double the unit figure as before.

as 342 at 17*s*.
171
17

£290 . 14 *Ans.*

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

8

273 . 12 at 16*s*.
17 . 2 at 1*s*.

L. 290 . 14 *Ans.*

or, 456 at 24*s*.

156
12

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

£12 · 6 *Ans.*

It is multiplied by 6, because there are 6 doz. in 72.
What will 84 come to at 12*s*. 10*d*. each ?
12*s*. 10*d*. = 151*d*. as shillings = £7 · 14 for 1 doz.
7

£53 · 18 *Ans.*

What will 108 come to at 9*s*. 5½*d*. each ?
9*s*. 5½*d*. = 113½*d*.; as shillings = £5 · 13 · 6 for 1 doz.
9

£51 · 1 · 6 *Ans.*

What will 126 come to at 15*s*. 8¾*d*. each ?
15*s*. 8¾*d*. = 188¾*d*.; as shillings = £9 · 8 · 9
10½

£99 · 1 · 10½ *Ans.*

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 17*s*. 7¼*d*. per gallon?
17*s*. 7¼*d*. = 211¼*d*.; as shillings = £10 · 11 · 3
12¼

Ans. £129 · 7 · 9¾

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

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

£1 . 9 . 7 *Ans.*

Note, The 3*s.* 7*d.* taken in when multiplying, is for the one difference between 24 (the quantity found when £2. 3*s.* 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 5*s.* 7*d.* per yard.

5*s* 7*d.* = 67*d*; as shillings = £3 . 7
5 dozen, giving the price of 60.

£16 . 15
11 . 2 The 2 deficient at 5*s.* 7*d.* each to add, being 11*s.* 2*d.*

Ans. £17 . 6 . 2

What will a chest of tea, containing 85 *lbs.*, cost at 4*s.* 2½*d.* per *lb.*?

4*s.* 2½*d.* = 50½*d.*; as shillings = £2 . 10 . 6 take in for 1 *lb*
7 4*s.* 2½*d.* when multiplying by 7.

Ans. £17 . 17 . 8½

What will 96½ *lbs.* of tea come to at 7*s.* 6⅜*d.* per *lb*?

7*s.* 6⅜*d.* = 90⅜*d.*; as shill. = £4 . 10 . 9 3*s* 9⅜*d.* to take in for the ½ *lb.* above the 8 doz.
8

Ans. £36 . 9 . 9⅜ *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 7*s.* 10¼*l.* per yard.

7*s.* 10¼*d.* = 94¼*d.*; as shill = £4 . 14 . 3
6 amount of 72.

28 . 5 . 6
7 . 10¼ deduct for 1 yd. the overplus.

Ans. £27 . 17 . 7¾

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

80 . 9 . 6 price of 144; too much
1 . 2 . $4\frac{1}{4}$ by 2 to deduct = £1 . 2. $4\frac{1}{4}$.
Ans. £79 . 7 . $1\frac{3}{4}$

What will 168 gallons of rum come to at 11*s*. $8\frac{3}{8}$*d*. per gallon?
11*s*. $8\frac{3}{8}$*d*. = 140$\frac{3}{8}$*s*. or £7 . 0 . $4\frac{1}{2}$
14

£98 . 5 . 3 *Ans*.

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*.?
648
72

720 *lbs*. as pence = 60*s*. or £3. at 1*d*. per *lb*.
5

£15 *Ans*.

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.*:

756
84

12)8 4 0 *lbs.* considered as pence.

70*s* = £3. 10. at 1*d.* per *lb.*
7

£24. 10 *Ans.*

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

864
96

12)960 *lbs.* as pence.

80*s.* = £4. at 1*d.* per *lb.*
$5\frac{3}{4}$

£23 *Ans.*

The same example by Rule of Three.

lb.		*d.*		*cwt qrs lbs.*
1	:	$5\frac{3}{4}$	: :	3 . 2 . 8
		4		4
farthings		23		34
				28
				280
				68
				960 *lbs.*
				23
				2880
				1920

4)22080 as farthings.

12)5520 as pence.

20)460 as shillings.

£23 *Ans.*

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

```
      972
      108
    ------
12)1080
    ------
                £.  s.
   90s. = 4·10 at 1d. per lb.
                6½
            ----------
          L.29 . 5  Ans.
```

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

```
      1092
       120
    ------
12)1212
    ------
                L.  s.
   101s. = 5 . 1 at 1d. per lb.
                8
            ----------
          L.40 . 8  Ans.
```

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

```
      1188
       132
    ------
12)1320
    ------
                L.  s.
   110s. = 5·10 at 1d.
                9½
            ----------
          L.52 . 5  Ans.
```

L. 2·15. to bring in.

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

```
      1296
       144
    ------
                L.
   1440d. = 6 at 1d.
                10¼
            ----------
          L. 61·10  Ans.
```

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

```
      1308
       144
    ------
12)1452
    ------
                L.  s.
   121s. = 6 . 1 at 1d. per lb.
                10½
            ----------
          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*?

1500
180

12)1680

140*s.* = *L.* 7

$10\frac{3}{4}$

L. 75 . 5 *Ans.*

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*?

1716
204

12)1920

160*s.* = *L.* 8 at 1*d.*

$11\frac{3}{4}$

L 94 *Ans.*

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.* 12 *lbs.* come to at 2*s.* 6*d.* per *lb*?

1868
216

2*s.* 6*d.* of a *L.* is $\frac{1}{8}$)2084

L. 260 . 10 *Ans.*

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 1*s.* 4*d* per *lb*?

3292
384

1*s.* 4*d.* of a £ is $\frac{1}{15}$)3676

L. 245 · 1 · 4 *Ans.*

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

6698
792

1*s.* 8*d.* of a *L.* is $\frac{1}{12}$)7490

L. 624 · 3 · 4 *Ans.*

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

10596
1260

11856*s.* = *L.* 592 · 16 at 1*s.*
3

L. 1778 · 8 *Ans.*

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 66*s.* 8*d.* per *cwt*?

L. 3 · 6 · 8 price of 1 *cwt.*
$6\frac{1}{2}$ *cwt.* *L.* 1 · 13 · 4 to bring in.

L. 21 · 13 · 4 *Ans.*

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.		
d.		£	*s.*	*d.*
$\frac{1}{4}$	is	0	2	4
$\frac{1}{2}$	"	0	4	8
$\frac{3}{4}$	"	0	7	0
1	"	0	9	4
$1\frac{1}{4}$	"	0	11	8
$1\frac{1}{2}$	"	0	14	0
$1\frac{3}{4}$	"	0	16	4
2	"	0	18	8
$2\frac{1}{4}$	"	1	1	0
$2\frac{1}{2}$	"	1	3	4
$2\frac{3}{4}$	"	1	5	8
3	"	1	8	0
$3\frac{1}{4}$	"	1	10	4

Per lb.		Per cwt.		
d.		£	*s.*	*d.*
$3\frac{1}{2}$	is	1	12	8
$3\frac{3}{4}$	"	1	15	0
4	"	1	17	4
$4\frac{1}{4}$	"	1	19	8
$4\frac{1}{2}$	"	2	2	0
$4\frac{3}{4}$	"	2	4	1
5	"	2	6	8
$5\frac{1}{4}$	"	2	9	0
$5\frac{1}{2}$	"	2	11	4
$5\frac{3}{4}$	"	2	13	8
6	"	2	16	0
$6\frac{1}{4}$	"	2	18	4
$6\frac{1}{2}$	"	3	0	8

Per lb.		Per cwt.		
d.		£	*s.*	*d*
$6\frac{3}{4}$	is	3	3	0
7	"	3	5	4
$7\frac{1}{4}$	"	3	7	8
$7\frac{1}{2}$	"	3	10	0
$7\frac{3}{4}$	"	3	12	1
8	"	3	14	8
$8\frac{1}{4}$	"	3	17	0
$8\frac{1}{2}$	"	3	19	4
$8\frac{3}{4}$	"	4	1	8
9	"	4	4	0
$9\frac{1}{4}$	"	4	6	4
$9\frac{1}{2}$	"	4	8	8
$9\frac{3}{4}$	"	4	11	0

Per lb.		Per cwt.		
d.		£	*s.*	*d*
10	is	4	13	4
$10\frac{1}{4}$	"	4	15	8
$10\frac{1}{2}$	"	4	18	0
$10\frac{3}{4}$	"	5	0	1
11	"	5	2	5
$11\frac{1}{4}$	"	5	5	0
$11\frac{1}{2}$	"	5	7	4
$11\frac{3}{4}$	"	5	9	8
12	"	5	12	0
$12\frac{1}{4}$	"	5	14	4
$12\frac{1}{2}$	"	5	16	8
$12\frac{3}{4}$	"	5	19	0
13	"	6	1	4

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

L.2 · 6 · 8 per *cwt*.
7

16 · 6 · 8 price of 7 *cwt*.
deduct 3 · 4 price of 8 *lbs*.

L 16 · 3 · 4 *Ans*.

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 8*s*. per *cwt*?

L. 4 · 4 per *cwt*.
12

50 · 8 price of 12 *cwt*.
3 deduct for 4 *lbs*.

L 50 · 5 *Ans*.

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

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

L 4 · 13 · 4 per *cwt*.
10

46 . 13 . 4
10 deduct for 1 *lb*.

L. 46 . 12 . 6 *Ans*.

L. 4 . 13 . 4 being 10d. per *lb*., for 1 *lb*. deduct 10*d*.

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

L. 5 . 12 per *cwt*.
12

L. 67 . 4 for 12 *cwt*.
6 deduct for 6 *lbs*.

L.66 . 18 *Ans*.

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

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

L. 5 . 10 . 6
$8\frac{1}{2}$

L 46 . 19 . 3 *Ans*.

L. 2 . 15 . 3 to bring in.

Cwts. qrs. and *lbs.* may be also done by the following much approved

RULE.

Multiply the *lbs*, by $2\frac{1}{7}$, and consider the product as pence; multiply the *qrs* by 5, and consider the product as shillings; the *cwts.* you are to consided as *L*

EXAMPLES.

WHAT will 73 *cwt.* 2 *qrs.* 7 *lbs.* cost at *L.*6 . 1 . 8 per *cwt* ?

	cwt. qrs. lbs.	
	73 . 2 . 7	
	5 . $2\frac{1}{7}$	*cwt. qrs. lbs. L.*
1*s* 8*d.* = $\frac{1}{12}$	73 . 11 . 3	price of 73 : 2 : 7 at 1 per *cwt.*
	6	
	441 . 7 . 6	
	6 . 2 . $7\frac{1}{4}$	at 1*s.* 8*d.* per *cwt.*
	L. 447 . 10 . $1\frac{1}{4}$	*Ans.*

DEMONSTRATION.

The cause of this Rule is evident; as at *L.*1 per *cwt.* a *qr.* must cost 5*s.*; and a *lb.* the 28th part of that, which is $2\frac{1}{7}d.$

What would 239 *cwt.* 3 *qrs.* 14 *lbs.* come to at *L.*4 2*s.* 6*d.* per *cwt*?

	cwt. qrs. lbs.	
	239 : 3 : 14	
	5 : $2\frac{1}{7}$	
2*s.* 6*d.* = $\frac{1}{8}$	239 : 17 : 6	price at 1 *L* per *cwt.*
	4	
	1159 : 10 : 0	
	36 : 4 : $8\frac{1}{4}$	at 2*s.* 6*d.* per *cwt.*
	1195 : 14 : $8\frac{1}{4}$	*Ans.*

By the above method, the trouble of taking parts for the *qrs.* and *lbs.* is entirely obviated.

In calculating *acres*, *roods* and *perches*, the same method may be adopted with advantage.

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?

a.	*r.*	*p.*	
60	: 2	: 8	
	5	: $1\frac{1}{2}$	
60	: 11	: 0	at *L.* 1 per acre.
		$3\frac{1}{2}$	
*L.*211	: 13	: 6	*Ans.* *L* 30 : 5 : 6 to bring in

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 11*s* ; 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?

a.	*r.*	*p.*	
80	: 3	: 24	
	5	: $1\frac{1}{2}$	
80	: 18	: 0	at *L.* 1
		$4\frac{1}{5}$	*L.* 26 : 19 : 4 to bring in.
*L.*350	: 11	: 4	*Ans.*

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

a.	*r.*	*p.*	
196	: 2	: 36	
	5	: $1\frac{1}{2}$	
196	: 14	: 6	at 1 *L.*
		6	
1180	: 7	. 0	at 6 *L*
1	: 12	: $9\frac{1}{2}$	deduct for 2*d.*
£1178	: 14	: $2\frac{1}{2}$	*Ans.*

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?

a.	*r.*	*p.*	
575 .	3 .	26	
	5 .	1½	
575 .	18 .	3	at £1 per acre.
		7	
4031 .	7 .	9	at £7.
28 .	15 .	10½	at 1*s.*
£1060 .	3 .	7¾	*Ans.*

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

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

EXAMPLES.

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

oz.	*dwts.*	*grs.*	
11 .	8 .	4	
	1 .	0½	
3*s.* 4*d.* = £⅙.)	11 .	8 . 2	at £1 per ounce.
£1 .	13 .	0⅓	*Ans.*

DEMONSTRATION.

The 8 *dwts* are considered as shillings, because there are 20 *dwts.* in the *oz.* and the *ounces* at £1 per *oz.* would give 1 shilling for each *dwt.*; the *grs.* are considered as ½*d.* each, on account of there being 24 *dwts.* to the *grain*, consequently each *grain* at ½*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 8*s*. 6*d*. per *oz*:

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

£	*s*.	*d*.	
70	· 0 ·	10	
3	· 10 ·	$0\frac{1}{2}$	at 1*s*.
		$8\frac{1}{2}$	
£29	· 15 ·	$4\frac{1}{4}$	

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

£147 · 16 · 9 at £1 per *oz*.
3

£443 · 10 · 3 *Ans*.

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

£131 · 15 · 0 at £1 per *oz*.
4

15*s*. $1\frac{3}{4}$*d*. at 1*d* to bring in.

£727 · 15 · $1\frac{3}{4}$ *Ans*.

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 4*d*. per yard.
1 ..... 5*d*.
1 ..... 6*d*.
1 ..... 7*d*.
1 ..... 8*d*.
1 ..... 12*d*.

6)42*d*.

Ans. 7*d*. per yard average.

6 pieces of 36 yards each, at 1*d*. per yard = 18*s*.
7

total £6 · 6

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, tho 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	8
20	6	0
20	8	2
20	11	10
5)	35	0

Ans. 7*s.* the average price.

100 lambs at 1*s.* equal to £5
7
£35 total.

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

100 yards at	5*s*	3*d.* per yard.
100	5 .	9
100	7 .	0
100	8 .	11
100	15 .	7
5)	12 .	6

s. 8 . 6 average per yard.

500 yards at 1*s.* = £25
$8\frac{1}{2}$
total £212 . 10

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

50 hats at	15*s.*	$3\frac{1}{2}d.$ each.
50	15 .	$8\frac{1}{2}$
50	17 .	6
50	19 .	10
4)	68 .	4
	s. 17 .	1 average.

200 at 1*s.* = £10 . 0
17 . 1 to bring in.
£170 . 16 . 8

200 at 1*d.* = 16*s.* 8*d.*

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

300 lambs at 9*s*. 9*d*. each.
300 ..... 11 . 5
300 ..... 12 . 7

3)33 . 9

s. 11 . 3 average.
900 at 1*s*. 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 ..... $12\frac{1}{4}$

6)42

7*d*. a yard average.

12 pieces, 48 yards each, at 1*d*. per yard = £2 . 8 . 0
7
total £16 . 16 . 0

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

10 books at 2*s*. $4\frac{1}{2}$*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 . $4\frac{1}{2}$
10 ..... 9 . $9\frac{3}{4}$
10 ..... 12 . $7\frac{3}{4}$

10)70 . 5

100 books at 1*s*. each = £5 . 0 . 0
7 . $0\frac{1}{2}$
total £35 . 4 . 2

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 81 *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 *lb.*
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)38

8*d.* per *lb.* average.

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

154*s.* = £7 . 14 . 0 being the amount of all at 1*d.*
Multip. by 8*d.* 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 1*s.* $5\frac{1}{2}$*d.* per gross.
10 ..... 2 . $0\frac{1}{2}$
10 ..... 2 . $4\frac{3}{4}$
10 ..... 3 . $1\frac{1}{4}$
10 ..... 3 . $3\frac{1}{4}$
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)15 . 10

s. 1 . 2 average per gross.

110 gross at 1*s.* per gross = £5 . 10 . 0
4 . 2

Ans £29 . 18 . 4

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
$2\frac{3}{4}$

£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 2*s.* 9*d.* Then 12 dozen being 144 at 1*s.* gives £7 4. and which, being multiplied by the average price, 2*s.* 9*d.* or $2\frac{3}{4}$*s.* 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	2*s.*	6*d*	each =	25*s*	0*d.*
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)500*s.* or £25 total.

5*s.* 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
12 pieces			12)72

6*d.* per yard average.

12 pieces at 1*d.* 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.

	s. *d.*		*s.* *d.*
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
100			100)450 = £22.10

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:

	d.		*d.*
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	$8\frac{1}{2}$	..... =	$25\frac{1}{2}$
20			20)130*d.*

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

20 firkins, 2 *qrs.* 16 *lbs.* each at 1*d.* = £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

	d		*d.*
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 1*d.*

$8\frac{1}{4}$ £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:

				s.	*d.*
10 shawls at	2*s.* 6*d*	each =		25*s.*	0*d.*
12	3	$8\frac{1}{3}$	.... =	41	3
15	1	$6\frac{1}{2}$	.... =	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:

	s.	
First cost per ton	3	0*d.*
Freight	9	0
Duty	2	0
	s. 19	0 per ton.

120 tons at 1*s.* per ton £6

£114 total amount.

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

	s.	
Prime cost per ton	7	6*d.*
Freight	8	6
Duty	1	6
	s. 17	6 per ton.

300 tons at 1*s.* = £15

£262 10 *Ans.*

A ship containing 1000 tons of coal, as follow:

Prime cost	8*s*. 6*d*.
Freight -	8 . 1
Duty -	2 . 6
	s. 19 . 1 per ton.

1000 tons at 1*s*.=£50 . 0

s. 19 . 1 1000 at 1*d*.=£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 1*s*. = £30
13
total £390

600 gallons.

Prime cost per gallon 4*s*.
Freight - - 1
Duty - - - 8

stands in 13*s*. 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 1*s*. each.

Prime cost per gallon 4*s*.
Freight - - - 1
Duty - - - 9

stands in 14*s*. 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 1*s*.=£36 . 1 . 6

Prime cost per gallon 5*s*. 0*d*. 19$\frac{1}{2}$
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 $\frac{9}{10}$ gall. = £60 2 $2\frac{2}{5}$ at 1*s.*

15

Prime cost per gallon	3*s.*	6*d.*			
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 1*s.* 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?

£36 By first Rule.
3

£108 taken as pence = 9*s*. *Ans.*

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

9*s*. *Ans.*

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

What is the interest of £ 18 for 4 months at 5 per cent ?

£48 for 1 month = 4*s*.
multiplied by 4 months.

16*s*. *Ans.*

DEMONSTRATION,

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

£.	£.	
100	5	1 £.
mo. 12		1 mo.
1200		1
		5
		£5
		240 No. of pence in a £.
		1200)1200(1 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 1*d.* 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 8*s.* 4*d.* consequently the Interest of *L.*1 for a month must be the $\frac{1}{100}$ of 8*s.* 4*d.* which is 1*d.*

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

interest for 1 month 8*s.*

7

*L.*2 . 16 *Ans.*

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

interest for 1 month = 9*s.*

2

18*s.* *Ans.*

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

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

8

*L.*4 . 8 *Ans.*

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

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

7

s. 19 . 3 *Ans.*

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

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

11

*L.*2 . 19 . 7 *Ans.*

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

10*s.* 6*d.* for 1 month.
10

*L.*5 . 5 . 0 *Ans.*

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

12*s.* 4*d.* for 1 month.
7

*L.*4 . 6 . 4 *Ans.*

What is the interest of *L.*28 · 10 for three months ?

2*s.* 4½*d.* for 1 month.
3

*s.*7 · 1½ *Ans.*

Here *L* 28 for 1 month is 28 pence, or 2*s.* 4*d.* and 10*s.* being half a pound is reckoned as ½ a penny, gives the interest for 1 month, which being multiplied by 3 (the number of months) gives 7*s.* 1½*d.* the answer required.

What is the interest of *L.*122 · 10 for 5 months ?

10*s.* 2½*d.* for 1 month.
5

*L.*2 · 11 · 0½ *Ans.*

Tell me the interest of £150 · 5 for 11 months.

12*s.* 6¼*d.* for 1 month.
11

£6 · 17 · 8¾ *Ans.*

Here the interest of 5*s.* for 1 month at 5 per cent. is ¼ of a penny.

What is the interest of £185 · 5 for 4 months ?

15*s.* 5¼*d.* for 1 month.
4

£3 · 1 · 9 *Ans.*

What is the interest of *L.*365 · 15 for 8 months ?

£1 · 10 · 5¾ for 1 month.
8

£12 · 3 · 10 *Ans.*

Here for 15*s* allow ¾*d* being the 3 quarters of a £.

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

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

10

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

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

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

7

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

In this question 2*s*. 6*d*. 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 . 7 . 6 for 2 months?

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

2

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

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

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

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

9

*L*5 . 19 . $8\frac{5}{8}$ *Ans.*

12*s*. 6*d*. 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 . $6\frac{7}{8}$ for 1 month.

11

L 45.19.$3\frac{5}{8}$ *Ans.*

17*s*. 6*d*. being $\frac{7}{8}$ of a *L*. $\frac{7}{8}$ of 1*d*. 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*.63 . 7 . 11 for 8 months?

L.63 . 7 . 11

8

L 517 . 3 . 4 = £2 . 5 . 7 *Ans.*

The £547 as pence are equal to £2 . 5 . 7 and the 3*s* 4*d*. 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, 7*s*. 11*d*. being a little above 7*s*. 6*d*. which is $\frac{3}{8}$ of a pound, consider it the $\frac{3}{8}$ of a penny, thus, 5*s*. 8*d*$\frac{3}{8}$. for 1 month.

8

£2 . 5 . 7 *Ans.*

What is the interest of £93 . 10 . 6 for 7 months ?

£93 . 10 . 6

7

£[illegible] . 13 . 6 = £2 . 17 . 5$\frac{1}{2}$ *Ans.*

The 689 [illegible] = £2 . 17 . 5 and the 13*s*. 6*d*. 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 ?

£100. for 1 month is 8*s*. 4*d*.

12

£5 . 0 . 0

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 1*d*. the interest of £1 for a year will consequently be 1*s*.

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 1*s*. 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 £15 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.*

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

What is the interest of £165 . 5 for 8 years ?

£3 . 5 . 3 for 1 year.
8
£66 . 2 . 0 *Ans*

What is the interest of £137 . 15 for 9 years ?

£9 . 7 . 9 for 1 year.
9
£84 . 9 . 9 *Ans.*

What is the interest of *L.* 190 . 2 . 6 for 3 years ?

L. 9 . 10 . $1\frac{1}{2}$ for 1 year.
3
L. 28 . 10 . $4\frac{1}{2}$ *Ans.*

As 2*s.* 6*d.* is the $\frac{1}{8}$ of a *L.* the $\frac{1}{8}$ of a shilling, $1\frac{1}{2}$. is allowed.

What is the interest of *L.* 245 . 7 . 6 for 9 years and 4 months ?

L. 12 . 5 . $4\frac{1}{2}$ for 1 year.
$9\frac{1}{3}$ *L.* 4 . 1 . $9\frac{1}{2}$ to bring in.
L. 114 . 10 . 2 *Ans.*

7*s.* 6*d.* being the $\frac{3}{8}$ of a *L.* the $\frac{3}{8}$ of a shilling $= 4\frac{1}{2}d.$ is allowed, the interest for 1 year being *L.* 12 . 5 . $4\frac{1}{2}$ the $\frac{1}{3}$ of it is added in for 4 months, which is the third of a year.

Another very short and simple Rule for Interest at L 5 per cent. for years, or years and months, is this :

Rule.—Consider the years as shillings and the months as pence, and take such part of the principal as those shillings and pence are of a *L.*, which will be the Answer.

Required the interest of *L.* 347 . 10 . 6 for 5 years.

5 years as 5*s.* is of a *L.* $\frac{1}{4}$)347 . 10 . 6
L. 86 . 17 . $7\frac{1}{2}$ *Ans.*

What is the interest of *L.* 827 . 10 . 8 for 2 years and 6 months ?

2 yrs. 6 m. $=$ 2*s* 6*d.* is $\frac{1}{8}$)827 . 10 . 8
L 103 . 8 . 10 *Ans.*

What is the interest of *L* 60 for 3 years and 4 months ?

3 yrs. 4 m. $=$ 3*s.* 4*d.* is $\frac{1}{6}$)60
*L.*10 *Ans.*

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

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

L 8 . 1 . 0½ *Ans.*

What is the interest of *L*.750 . 15 . 7½. for 1 year and 4 months ?

1 yr. 4. m. = 1*s*. 4*d*. of a *L*. is $\frac{1}{15}$) 750 . 15 . 7½

L.50 . 1 . 0½ *Ans.*

What is the interest of *L*.999 . 15 . 6 for 1 year and 3 months ?

1 yr. 3 m. = 1*s*. 3*d*. is of a *L* $\frac{1}{12}$)999 . 15 . 6

£83 . 6 . 3½ *Ans.*

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

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

£598 . 10 . 10 *Ans.*

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

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

			yrs.	m.
2 yrs. 6 m. as 2*s*. 6*d*. is $\frac{1}{2}$)	460 . 3	for	5	0
	230 . 1 . 6	for	2	6
	L.690 . 4 . 6	for	7	6

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

DEMONSTRATION OF £6 PER CENT.

£		£	£
If 100	}	give 6	{ 1
in 12 mo.	}		{ 1 mo.
1200			1
			6
			6£

240*d.* in a £

1200)1440(1$\frac{1}{5}d.$
1200

240 { 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$\frac{1}{5}d.$ any principal, multiplied by what months soever, will be 1$\frac{1}{5}d.$; 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 1½*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.

3

9|0 = 9*s.* 0*d.* *Ans.*

Here the principal, £30, is multiplied by 3, which produces £90 of which the unit figure is cut off, leaving 9*s.* 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?

£40
9

36|0 = £1 . 16 *Ans.*

What is the interest of £50 for 7 months?

£50
7

35|0 = £1 . 15 *Ans.*

What is the interest of £70 for 8 months?

£70
8

56|0 = £2 . 16 *Ans.*

What is the interest of £95 for 8 months?

£95
8

76|0 = £3·16. *Ans.*

What is the interest of £73 for 7 months?

£73
7

51|1 = £2·11 . $1\frac{1}{2}$. *Ans.*

Here the unit figure cut off is by the Rule considered as $1\frac{1}{2}d.$ which with 51*s.* give the Answer £2·11 . $1\frac{1}{2}$.

What is the interest of £87 for 6 months?

£87
6

52|2 = £2·12 . $2\frac{2}{5}$. *Ans.*

What is the interest of £97 for 9 months?

£97
9

87|3 = £4·7 . $3\frac{3}{5}$. *Ans.*

What is the interest of £108 for 8 months?

£108
8

86|4 = £4 . 6 . $4\frac{4}{5}$. *Ans.*

Find the interest of £125 for 9 months.

£125
9

112|5 = £5·12 . 6. *Ans.*

Here the unit figure cut off is 5, which is to be considered as $5\frac{5}{5}d.$ and as $\frac{5}{5}$ are equal to 1*d.* the pence are 6, which with 112*s.* give £5·12 . 6.

What is the interest of £137 for 8 months?

£137
8

109|6 = £5 . 9 . $7\frac{1}{5}$. *Ans.*

In this question the figure cut off is 6, which is $6\frac{6}{5}d.$ and as 5 fifths are 1*d.* 6 fifths are $1\frac{1}{5}d.$ with the 6*d.* is $7\frac{1}{5}d.$ and 109*s.* added give £5 . 9 . $7\frac{1}{5}$.

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

£146 . 6 . 8
9

131|7 . 0 . 0 = £6·11 . $8\frac{3}{5}$. *Ans.*

There is 6*s* 8*d*. in this question, which by adhering to the Rule must be multiplied, and the unit figure of the pounds cut off, which is $7\frac{7}{5}$ or $8\frac{2}{5}$.

What is the interest of £143 . 10 for 8 months?

£148 . 10

8

118 | 8 . 0 = £5 . 18 . $9\frac{1}{5}$. *Ans.*

What is the interest of £207 . 13 . 4 for 9 months?

£207 . 13 . 4

9

186 | 9 . 0 . 0 = £9 . 6 . $10\frac{1}{5}$. *Ans.*

The highest unit figure has now been arrived at, which is 9, that is 9*d*. and 9 fifths equal to $1\frac{4}{5}d$. give $10\frac{1}{5}d$.

What is the interest of £125 . 10 for 11 months?

£125 . 10

11

138 | 0 . 10 = £6 . 13 . $0\frac{1}{2}$. *Ans.*

After multiplying the principal by 11 there are 10*s*. for which $\frac{1}{2}d$. is allowed, which is sufficiently near for business, though in reality it may be reckoned as $\frac{3}{5}$.

What is the interest of £285 . 8 . 9 for 12 months?

£285 . 8 . 9

12

342 | 5 . 5 . 0 = £17 . 2 . $6\frac{1}{4}$. *Ans.*

What is the interest of £290 . 1 . 3 for 12 months?

£290 . 1 . 3

12

348 | 0 . 15 = £17 . 3 . $0\frac{3}{4}$. *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 £17 . 3 . $0\frac{3}{4}$.

What is the interest of £357 . 4 . 2 for 4 months?

£357 . 4 . 2

4

142 | 8 . 16 . 8 = £7 . 2 . $10\frac{1}{5}$. *Ans.*

The 8 cut off is $8\frac{8}{5}$ or $9\frac{3}{5}$ with a penny allowed for the 16*s*. 8*d* gives $10\frac{1}{5}$.

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

£365 . 8 . 10
13

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

As any thing above 12*s*. 6*d* 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 15*s*. add $\frac{3}{4}d$.

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

£825 . 9 . 2
14

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

Here the 6 cut off is $7\frac{1}{2}$, and the 8*s*. 4*d*. 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?

£70
20 months = 1 yr. 8 m.

140|0 = £7. *Ans.*

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

£85
30 = 2 yrs. 6 m.

255|0 = £12 . 15. *Ans.*

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

£30
40 months.

120|0 = £6. *Ans.*

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

£147
50 months.

735|0 = £36 . 15. *Ans.*

What is the interest of £289 for 10 years?

£289
120 months.

3468|0 = £173 . 8. *Ans.*

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

£165
65

825
990

1072|5 = £53 . 12 . 6. *Ans.*

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

£187
102

1907|4 = £95 . 7 . $4\frac{4}{5}$. *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.

£30
3

4)
9|0 = 9*s*. 0*d*. at 6 per cent.
2 . 3

s.6 . 9*d* at $4\frac{1}{2}$ per cent. *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?

£145
5

4)
72|5 = £3 . 12 . 6 at 6 per cent.
18 . $1\frac{1}{2}$ deduct.

£2 . 14 . $4\frac{1}{2}$ *Ans.*

What is the interest of *L* 150 . 10 . 6 for 7 months ?

L 150 . 10 . 6
7
105 | 3 . 13 . 6 = *L*.5 . 5 . 4¼ at 6 per cent. (4)
1 . 6 . 4 deduct.
L.3 . 19 . 0¼ *Ans.*

Find the interest of *L*.347 . 18 . 10 for 7 months ?

L.347 . 18 . 10
7
243 | 5 . 11 . 10 = *L*.12 . 3 . 6½ at 6 per cent. (4)
3 . 0 . 10½ deduct.
L.9 . 2 . 8 *Ans.*

11*s*. 10*d*. not being ¾*d*. allow ½*d*. for it.

What is the interest of *L* 420 . 11 . 7 for 11 months ?

L.420 . 11 . 7
11
462 | 6 . 7 . 5 = *L*.23 . 2 . 7½ at 6 per cent. (4)
5 . 15 . 7¾ deduct.
L.17 . 6 . 11¾ *Ans.*

What is the interest of *L* 100 for 12 months ?

L.100
12
120 | 0 = *L*.6

¼ of *L*.6 at 6 per cent.
1 . 10 . 0
L.4 . 10 . 0 *Proof.*

Calculations of Interest at 4½ 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 . 5 for 4 months at 4½ per cent ?

L.185 . 5
3 = to ¾ of 4 months.
55 | 5 . 15 = *L*.2 . 15 . 6¾ *Ans.*

What is the interest of *L* 225 . 8 . 10½ for 8 months ?

L.225 . 8 . 10½
6 = to ¾ of 8 months.
135 | 2 . 13 . 3 = *L*.6 . 15 . 3 *Ans.*

In this instance the $2\frac{3}{4}$ and the allowance made for the 13*s*. 3*d*. give fully 3 pence.

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

L.228 . 17 . $8\frac{1}{4}$

$12 = \frac{3}{4}$ of 16 months.

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

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

L.380 . 1 . 4

$15 = \frac{3}{4}$ of 20 months.

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

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

L.100

$9 = \frac{3}{4}$ of 12 months.

90|0 = *L*.4 . 10 *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 ?

L.55 . 3

5

3)

27|5 . 15 = *L*.1 . 7 . $6\frac{3}{4}$ at 6 per cent.

9 . $2\frac{1}{4}$ deduct.

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

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

L.126 . 10

7

33|5 . 10 = *L*.4 . 8 . $6\frac{1}{2}$ at 6 per cent.

deduct $\frac{1}{3}$ 1 . 9 . 6

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

What is the interest of *L*.158 . 2 . 8¼ for 11 months ?

L.158 . 2 . 8¼
11

173|9 . 9 . 6¾ = *L*.8 . 13 . 11¼
deduct ⅓ 2 . 17 . 11¾

L 5 . 15 . 11½ *Ans.*

The following will be much shortened by multiplying by ⅔ of the time.

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

L.286 . 9 . 2
2 = ⅔ of 3 months.

57|2 . 18 . 4 = *L*.2 . 17 . 3½ *Ans.*

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

L.320 . 17 . 6
4 = ⅔ of 6 months.

128|3 . 10 . 0 = *L*.6 . 8 . 4⅕. *Ans.*

What is the interest of *L*.427 . 18 . 9¼ for 9 months ?

L.427 . 18 . 9¼
6 = ⅔ of 9 months.

256|7 . 12 . 7½ = *L*.12 . 16 . 9 *Ans.*

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

L.583 . 0 . 8
10 = ⅔ of 15 months.

583|0 . 6 . 8 = *L*.29 . 3 . 0¼ or ⅘. *Ans.*

What is the interest of *L*.580 . 19 . 8¾ for 1 year 6 months ?

L.580 . 19 . 8¾
12 = ⅔ of 18 months.

697|1 . 16 . 9 = *L*.34 . 17 . 2¼ *Ans.*

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

L.100
8 = ⅔ of 12 months.

80|0 = *L*.4 *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 ?

£30
2 $\frac{1}{2}$ of 4 is 2 months.
add $\frac{1}{6}$)6 | 0 at 3 per cent.
1 . 0
s. 7 . 0 at $3\frac{1}{2}$ per cent.

What is the interest of £45 for 6 months ?

£45
3
6)
13 | 5 = 13*s.* 6*d.* at 3 per cent.
2 . 3
s. 15 . 9 at $3\frac{1}{2}$ per cent.

What is the interest of £85 for 8 months ?

£85
4 $\frac{1}{2}$ of 8 is 4 months.
6)34 | 0 at 3 per cent.
5 . 8
£1 . 19 . 8 at $3\frac{1}{2}$ per cent. *Ans.*

What is the interest of £90 for 7 months ?

£90
7
$\frac{1}{2}$)63 | 0 at 6 per cent.
$\frac{1}{6}$) 31 . 6 at 3 per cent.
5 . 3
£1 . 16 . 9 at $3\frac{1}{2}$ per cent. *Ans.*

What is the interest of £125 for 10 months ?

£125 $\frac{1}{2}$ of 10 months is 5 months.
5
$\frac{1}{6}$)
62 | 5 = £3 . 2 . 6 at 3 per cent
10 . 5
£3 . 12 . 11 *Ans.*

What is the interest of £145·10 for 12 months?

£145·10 $\frac{1}{2}$ of 12 months is 6 months.
6

$\frac{1}{6}$)
87|3·0 = £4· 7·3$\frac{1}{2}$ at 3 per cent.
14·6$\frac{1}{2}$
£5·1·10 *Ans.*

What is the interest of £365 for 8 months?

£365
4 $\frac{1}{2}$ of 8 is 4 months.
$\frac{1}{6}$)146|0 at 3 per cent.
24 · 4
£8·10 · 4 at 3$\frac{1}{2}$ per cent. *Ans.*

What is the interest £540 for 9 months?

£540
9
$\frac{1}{2}$)486|0
$\frac{1}{6}$)243 · 0 at 3 per cent.
40 · 6
287 · 6 = £14·7·6 at 3$\frac{1}{2}$ per cent. *Ans.*

What is the interest of £650 for 11 months?

£650
11
$\frac{1}{2}$)715|0
$\frac{1}{6}$)357·6 at 3 per cent.
59·7
417·1 = £20·17·1 at 3$\frac{1}{2}$ per cent. *Ans.*

What is the interest of £1225 for 8 months?

£1225
4 $\frac{1}{2}$ of 8 is 4 months.
$\frac{1}{6}$)490|0 at 3 per cent.
81 · 8
571 · 8 = £28·11·8 at 3$\frac{1}{2}$ per cent. *Ans.*

What is the interest of £575 for 1 yr. and 4 months?

£575
8 $\frac{1}{2}$ of 16 is 8 months.
$\frac{1}{6}$)460|0 at 3 per cent.
76 · 8
536 · 8 = £26·16·8 at 3$\frac{1}{2}$ per cent. *Ans.*

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

£475

10 ½ of 20 is 10 months.

6)475|0 at 3 per cent.

79 . 2

554 . 2 = £27 . 14 . 2 at 3½ per cent. *Ans.*

What is the interest of £100 for 12 months at 3½ per cent?

£100

6 ½ of 12 is 6 months.

6)60|0 Proof of 3½ per cent being

10 . 0 perfectly accurate.

s.70 . 0 = £3 . 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?

*L.*40

1 being ½ of 2 months.

*s.*4|0 *Ans*

What is the interest of *L.*45 . 10 for 4 months?

*L.*45 . 10

2 the ½ of 4 months.

*s.*9|1½*d.* *Ans.*

What is the interest of *L* 55 . 10 for 8 months?

*L.*55 . 10

4 the ½ of 8 months.

22|2⅔ = *L.*1 . 2 . 2⅔ *Ans.*

What is the interest of *L* 91 . 10 for 10 months?

*L.*91 . 10

5 the ½ of 10 months.

45|7 . 10 = *L* 2 . 5 . 9. *Ans.*

What is the interest of £125·10 for 12 months?

£125·10
6 the ½ of 12 months.

75|2½ = £3·15 · 3½. *Ans.*

What is the interest of £130 for 7 months?

£130
7

2)91|0

45 . 6 = £2 . 5 . 6. *Ans.*

What is the interest of £155 . 6 . 8 for 9 months?

£155 . 6 . 8
9

2)139|8⅓ 0

69·10⅔ = £3 . 9 . 10⅔. *Ans.*

What is the interest of £225 for 5 months?

£225
5

112|5 = ½) *L.*5·12 . 6 at 6 per cent.

*L.*2·16 . 3 at 3 per cent.

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

*L.*395
11

434|5 = ½) *L.*21·14 . 6 at 6 per cent.

*L.*10·17 . 3 at 3 per cent.

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

*L.*550
7

½)385|0

192 . 6 = *L.*9·12 . 6. *Ans.*

What is the interest of *L* 651·10 for 1 year 2 months?

*L.*651·10
7 the ½ of 14 months.

456|0·10 = *L.*22·16 . 0½. or ½*d.* *Ans.*

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

£650 . 5

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

585|2 . 5 = £29 . 5 . $2\frac{1}{2}$. *Ans.*

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.

728|0 . 15 . 0 = £36 . 8 . $0\frac{3}{4}$. *Ans.*

What is the interest of £100 for 12 months?

£100

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

600 = £6. *Ans.*

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

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

4

£1 . 0 . 0 at $3\frac{3}{4}$ per cent. *Ans.*

What is the interest of £30 for 6 months?

£30

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

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

6

30 = £1 . 10 at $3\frac{3}{4}$ per cent. *Ans.*

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

61 . 3 = £3 . 1 . 3 at $3\frac{3}{4}$ per cent. *Ans*

What is the interest of *L*.206 . 13 . 4 for 9 months ?

L 206 . 13 . 4
9

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

add $\frac{1}{4}$)93 at 3 per cent.
23 . 3

116 . 3 = *L*.5 . 16 . 3 at $3\frac{3}{4}$ per cent. *Ans.*

What is the interest of *L*.345 . 9 . $1\frac{1}{4}$ for 11 months ?

L.345 . 9 . $1\frac{1}{4}$
11

$\frac{1}{2}$)380|0 . 0 . $1\frac{3}{4}$ at 6 per cent.

add $\frac{1}{4}$)190 - at 3 per cent.
47 . 6

237 . 6 = *L*.11 . 17 . 6 at $3\frac{3}{4}$ per cent. *Ans.*

What is the interest of *L* 405 . 10 for 1 year 8 months ?

L.405 . 10
10

405|5 . 0 = $\frac{\frac{1}{4}}{L}$.20 . 5 . 6 at 3 per cent.
5 . 1 . $4\frac{1}{2}$

L.25 . 6 . $10\frac{1}{2}$ at $3\frac{3}{4}$ per cent. *Ans.*

What is the interest of *L*.560 for 1 yr. and 10 months ?

L.560
11 is $\frac{1}{2}$ of 22 months.

add $\frac{1}{4}$)616|0 at 3 per cent.
154

770 = *L*.38 . 10 *Ans.*

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

L 100
6 is $\frac{1}{2}$ of 12 months.

add $\frac{1}{4}$)60|0 at 3 per cent.
15

75 = *L*.3 . 15. *Proof.*

RULE for Interest at $3\frac{1}{3}$ per cent. (the rate in general used in Savings' Banks)—Calculate at 5 per cent. and deduct $\frac{1}{3}$ from that amount, the remainder will be the answer.

Or, multiply the interest for 1 month at 5 per cent. by $\frac{2}{3}$ of the months when found convenient.

EXAMPLES.

WHAT is the interest of *L* 36 for 2 months at $3\frac{1}{3}$ per cent?

L.36 for 1 month at 5 per cent. = 3*s*.
2

deduct $\frac{1}{3}$)6*s*. at 5 per cent
2

Ans. 4*s*. at $3\frac{1}{3}$ per cent.

What is the interest of *L*.126 for 5 months?

10*s*. 6*d*.
5

deduct $\frac{1}{3}$)2·12·6 at 5 per. cent.
17·6

L.1·15·0 at $3\frac{1}{3}$ per cent. *Ans*.

What is the interest of *L*.132 for 8 months?

11*s*.
8

$\frac{1}{3}$)4· 8 at 5 per cent.
1· 9·4

L.2·18·8 at $3\frac{1}{3}$ per cent. *Ans*

What is the interest of *L* 150 for 9 months?

12*s*. 6*d*. for 1 month at 5 per cent.
6 the $\frac{2}{3}$ of 9 months.

L.3·15·0 *Ans*.

What is the interest of *L*.245 . 5 for 12 months?

L 1 . 0 . $5\frac{1}{4}$ for 1 month at 5 per cent.
8 the $\frac{2}{3}$ of 12 months.

L.8 . 3 . 6 *Ans*.

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 ?

3*s*. 4*d*. 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 ?

3*s*.
3
take $\frac{1}{2}$)9*s*. at 5 per cent.

4*s*. 6*d*. at $2\frac{1}{2}$ per cent. *Ans*.

What is the interest of *L*.48 for 4 months ?

4*s*. for 1 month at 5 per cent.
2 the $\frac{1}{2}$ of 4 months.

8*s*. at $2\frac{1}{2}$ per cent. *Ans*.

What is the interest of *L*.120 for 7 months ?

10*s*.
7 or, 10*s*. 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 ?

12*s*. $1\frac{1}{2}d$. 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 . 10¼ for 1 month at 5 per cent.
8 the ½ of 16 months.

L.16 . 6 . 10 at 2½ per cent. *Ans.*

What is the interest of *L*.300 . 2 . 6 for 1 year and 10 months?

L.1 . 10 . 3⅛ for 1 month at 5 per cent.
11

L.16 . 17 . 5⅜ *Ans.*

What is the interest of *L*.968 . 10 for 2 years 1 month?

L.4 . 0 . 8½
12½ the ½ of 25 months.

L.50 . 8 . 10¼ *Ans.*

What is the interest of *L*.1000 . 10 for 2 yrs. 4 months?

L.4 . 3 . 4½ for 1 month at 5 per cent.
14

L.58 . 7 . 3 *Ans.*

What is the interest of *L* 100 for 12 months?

8*s*. 4*d*. for 1 month at 5 per cent.
6 the ½ of 12 months.

L.2 . 10 . 0 *Proof.*

RULE for interest at 2 per cent.—Calculate at 6 per cent. and take ⅓, which will be the answer.

Or, multiply the principal by ⅓ 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 ⅓ of 3 months.

s. . *Ans.*

What is the interest of *L*.55 for 4 months?

*L*55
4

take ⅓)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 ?

L.70 . 10
5

3)
35|2 . 10 = *L*.1 . 15 . 3 at 6 per cent.

11 9 at 2 per cent. *Ans*

What is the interest of *L* 80 . 15 for 6 months ?

L.80 15
2 the $\frac{1}{3}$ of 6 months.

16|1 10 = 16*s*. $1\frac{3}{4}$*d* or $\frac{7}{4}$ *Ans*.

What is the interest of *L*.160 . 12 . 6 for 8 months ?

L 160 12 6
8

$\frac{1}{3}$)
128|5 0 . 0 = *L*.6 . 8 . 6 at 6 per cent.

Ans *L* 2 2 . 10 at 2 per cent.

What is the interest of *L* 247 . 10 for 9 months ?

L 247 . 10
3 the $\frac{1}{3}$ of 9 months

74|2 . 10 = *L* 3 . 14 . 3 *Ans*.

What is the interest of *L*.345 1 . 6 for 10 months ?

L.3 5 . 1 . 6
10

$\frac{1}{3}$)
345|0 . 15 . 0 = *L*.17 . 5 . $0\frac{3}{4}$ 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 ?

L.356 . 7
5 the $\frac{1}{3}$ of 15 months.

178|1 . 15 = *L*.8 . 18 . 2 *Ans*.

What is the interest of *L* 425 for 1 year and 9 months ?

L.425
7 the $\frac{1}{3}$ of 21 months.

297|5 = *L* 14 . 17 . 6 *Ans*

What is the interest of *L* 480 . 3 . 4 for 2 years and 3 months ?

L.480 . 3 . 4
9 the $\frac{1}{3}$ of 27 months.

432|1 . 10 . 0 = *L*.21 . 12 . 1 *Ans*.

What is the interest of *L*.655 . 12 . 6 for 2 years at 2 per cent ?

L.655 . 12 . 6

8 the $\frac{1}{3}$ of 24 months.

524|5 . 0 . 0 = *L*.26 . 4 . 6. *Ans.*

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

L.100

4 the $\frac{1}{3}$ of 12 months.

40|0 = *L*.2 *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 prineipal 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 ?

L.30

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

s.3|0 *Ans.*

What is the interest of *L*.50 for 5 months ?

L.50

5

take $\frac{1}{4}$)25|0 at 6 per cent.

s.6 . 3 *Ans.*

What is the interest of *L*.70 for 7 months ?

L.70

7

take $\frac{1}{4}$)49|0 at 6 per cent.

s.12 . 3 at $1\frac{1}{2}$ per cent. *Ans.*

What is the interest of *L*.75 . 10 for 8 months ?

L.75 . 10

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

s.15 . $1\frac{1}{2}$ *Ans.*

What is the interest of *L*.125 . 6 . 8 for 9 months ?

L.125 . 6 . 8

9

112|8 . 0 . 0 = *L*.5 . 12 . 9 $\frac{1}{4}$) at 6 per cent.

L.1 . 8 . 2 $\frac{3}{4}$ at $1\frac{1}{2}$ per cent. *Ans.*

What is the interest of £165·13·4 for 12 months ?

£165·13·4

3 the $\frac{1}{4}$ of 12 month.

49|7·0·0 = £2·9·8$\frac{1}{3}$. *Ans.*

What is the interest of £245·10 for 1 yr. 8 months ?

£245·10

5 the $\frac{1}{4}$ of 20 months.

122|7·10 = £6·2·9. *Ans.*

What is the interest of £365 for 2 years ?

£365

6 the $\frac{1}{4}$ of 24 months.

219|0 = £10·19. *Ans.*

What is the interest of £475 for 2 years 4 months ?

£475

7 the $\frac{1}{4}$ of 28 months.

332|5 = £16·12·6. *Ans*

What is the interest of £575 for 3 years ?

£575

9 the $\frac{1}{4}$ of 36 months.

517|5 = £25·17·6. *Ans.*

What is the interest of £840·10 for 3 years 4 months ?

£840·10

10 the $\frac{1}{4}$ of 40 months.

8405 · 0 = £42·0·6. *Ans.*

What is the interest of £951 for 3 years 8 months ?

£951

11 the $\frac{1}{4}$ of 44 months.

1046|1 = £52·6·1$\frac{1}{2}$. *Ans.*

What is the interest of £100 for 12 months ?

£100

3 the $\frac{1}{4}$ of 12 months.

30|0 = £1·10. *Proof.*

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 £18 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 £93 for 5 months?

8s.
5

$\frac{1}{4}$)2 . 0 . 0 at 5 per cent.

10s *Ans.*

What is the interest of £94 . 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 £111 . 10 for 11 months?

12s. $6\frac{1}{2}d$
11

take off $\frac{1}{4}$)6 . 12 $5\frac{1}{2}$ at 5 per cent

£1 . 13 . $1\frac{1}{2}$ *Ans.*

What is the interest of £195 . 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 8 months?

£1 . 10 . $5\frac{1}{2}$ 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?

8*s*. 4*d*. for 1 month
3 the ¼ of 12 months.

£1 . 5 . 0 *Ans.*

RULE for Interest, Discount, or Commission at ½ 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 ½*d*. for 8 or 10 add ½*d*. for 12 or 14 add ⅖*d* and for 16*s*. 8*d*. and upwards add 1*d*. 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 17.

EXAMPLES.

WHAT is the commission on £120 at ½ per cent.?

£120 = 12*s*. *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 12*s*.

What is the discount on £321 at ½ per cent?

£32|1 = £1 . 12 . 1½. *Ans.*

Here the figure cut off is 1½*d*. the 32 not cut off are 32 shillings

What is the interest of £425 at ½ per cent?

£42|5 = £2 . 2 . 6. *Ans.*

The 5 cut off is 5½, equal to 6*d*. This is of course the interest for 12 months.

What is the commission on £1255 . 5 at ½ per cent.?

£125|5 . 5 = £6 . 5 . 6¼. *Ans.*

For the 5 shillings, ¼*d*. is to be allowed, see Rule

What is the brokerage on £1450·12 . 6 at ½ per cent.?

£145|0·12 . 6 = £7 . 5 . 0¾. *Ans*

What is the discount of £1552 at $\frac{1}{2}$ per cent.?

£155|2 = £7·15 . $2\frac{2}{5}$. or $2\frac{1}{4}d$. *Ans.*

Find the commission on £7647 at $\frac{1}{2}$ per cent.?

£764|7 = £38 . 4 . $8\frac{2}{5}$. or $\frac{1}{4}d$. *Ans.*

The $7\frac{7}{5}d$. are = to $8\frac{2}{5}d$. as five-fifths are 1*d*. seven-pence seven-fifths are equal to $8\frac{2}{5}d$.

What is the discount on £8769·16 . 8 at $\frac{1}{2}$ per cent.?

£876|9·16 . 8 = £43·16·$11\frac{1}{5}$. or $\frac{3}{4}d$. *Ans.*

What is the brokerage on £10568 . 4 at $\frac{1}{2}$ per cent.?

£1056|8 . 4 = £52·16 . $9\frac{3}{4}$. *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 £4270·10 at $\frac{1}{4}$ per cent.

£427|0·10 = $\frac{1}{2}$) £21 · 7 . $0\frac{1}{2}$ at $\frac{1}{2}$ per cent.

£10·13 . $6\frac{1}{4}$ at $\frac{1}{4}$ per cent. *Ans.*

Find the discount on £8485·18 . 2 at $\frac{1}{8}$ per cent.

£848|5·18 . 2 = $\frac{1}{4}$) £42 . 8 . 7 at $\frac{1}{2}$ per cent.

£10·12 . $1\frac{3}{4}$ at $\frac{1}{8}$ 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 $3\frac{35}{365}d.$, 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.?

£10
10
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.?

£20
20
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.?

£30
30
900 = 3*s*. 0*d*.
0½ deduct for 3*s*.
s.2 · 11½ *Ans*.

Note, As 100 is 4*d*. 300 must be 1*s* therefore dividing by 300 gives shillings, observing to allow 4*d*. for every 100 over, after dividing by 300, as the following Examples more clearly explain.

What is the interest of £30 for 30 days?

£30
30
3|00)9|00
s.3 minus ½*d*. *Ans*. 2*s*. 11½*d*.

By cancelling 2 figures at each side, it reduces the operation to simply dividing by 3.

What is the interest of £40 for 40 days?

£40
40
3|00)16|00
s.5 · 4 minus 1*d*.

100 over = to 4*d*.

5*s*. 4*d*. being nearly 6*s*.
Ans. 5*s*. 3*d*.

What is the interest of £45 for 40 days?

£45
40
3|00)18|00
s 6 minus 1*d*. *Ans*. 5*s*. 11*d*.

What is the interest of £50 for 50 days?

£50
50
3|00)25|00
s.8 · 4 minus 1½*d*. *Ans*. 8*s*. 2½*d*.

100 over, for which allow 4*d*.

What is the interest of £60 for 60 days?

£60
60
3|00)36|00
s.12 · 0 minus 2*d*. *Ans*. 11*s* 10*d*

What is the interest of *L*.65 for 70 days?

L.65
70 — 50 over, for which allow 2*d*.

3|00)45|50

s.15·2 minus $2\frac{1}{2}d$. *Ans*. 14*s*. $11\frac{1}{2}d$.

What is the interest of *L*.85 for 80 days?

L.85
80

3|00)68|00

s.22·8 minus $3\frac{3}{4}d$. *Ans*. *L*.1·2·$4\frac{1}{4}d$.

What is the interest of £95 for 50 days?

L.95
50 — 250 over at 4*d*. per 100 comes to 10 pence.

3|00)47|50

s.15·10 minus $2\frac{1}{2}d$. *Ans*. 15*s*. $7\frac{1}{2}d$.

What is the interest of *L*.125 for 95 days?

L.125
95 — 175 over, being $1\frac{3}{4}$ of a 100, allow 7 pence.

625
1125

3|00)118|75

s.39·7 minus $6\frac{1}{2}d$. *Ans*. £1·19·$0\frac{1}{2}$

What is the interest of £155 for 110 days?

L.155
110 — 250 over, at 4*d*. a 100, comes to 10 pence.

3|00)170|50

56·10 minus $9\frac{1}{2}d$. *Ans*. 2·16·$0\frac{1}{2}$

What is the interest of £3405 for 5 days?

£3405
5 — 225 being $2\frac{1}{4}$ of 100, allow 9*d*.

3|00)170|25

56·9 minus $9\frac{1}{2}d$. *Ans*. 2·15·$11\frac{1}{2}$.

What is the interest of £975 for 130 days?

£975
130 150 over, allow 6*d*.

3|00)1267|50

422·6 minus 5*s* 10*d*. *Ans.* *L*.20·16·8

What is the interest of £1245·10 for 20 days?

£1245·10
20 10 over, allow $\frac{1}{2}d$ for.

3|00)249|10

83 $0\frac{1}{2}$ minus 1*s* $1\frac{3}{4}d$. *Ans.* *L*4·1·10$\frac{3}{4}$.

What is the interest of £1680·10 for 30 days?

£1680·10
30 15 over, allow $\frac{1}{2}d$.

3|00)504|15

168·$0\frac{1}{2}$ minus 2*s* $3\frac{1}{2}d$. *Ans.* £8·5·9

What is the interest of *L* 100 for 365 days at 6 per cent?

365
100 200 over, allow 8*d*.

3|00)365|00

121·8 minus 1*s*. 8*d*. *Proof* £6.

It appears that for 1*s*. 8*d*. 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 $\frac{1}{73}$ off, instead of $\frac{1}{72}$, which is a penny for every six shillings, will find it calculated to a mathematical niccty.

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.?

L.45
40

3|00)18|00

s.6 minus 1*d*.

$\frac{1}{6}$) 5*s*. 11*d*. 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?

£30
30

3|00)9|00

3 minus $\frac{1}{2}d$.

$\frac{1}{6}$)2*s*. $11\frac{1}{2}d$. 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?

£60
60

3|00)36|00

s.12 minus 2*d*. at 6 per cent 11*s*. 10*d*.
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?

95
90

3|00)85|50

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?

*L.*20
2 is $\frac{1}{3}$ of 6.

4|0 = 4*d.* *Ans.*

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?

*L.*40
3 is $\frac{1}{3}$ of 9 days.

d. 12|0 *Ans.* 1*s.*

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.

8|0 = 3*d.* *Ans.*

What is the interest of *L* 25 for 24 days?

*L.*25
8 = $\frac{1}{3}$ of 24 days.

*d.*20|0 = 1*s.* 8*d.* minus $\frac{1}{4}d.$ *Ans.* 1*s.* $7\frac{3}{4}$

What is the interest of *L.*60 for 18 days?

*L.*60
6 = $\frac{1}{3}$ of 18 days?

*d.*36|0 = 3*s.* minus $\frac{1}{2}d.$ *Ans.* 2*s.* $11\frac{1}{2}d.$

What is the interest of *L.*45 for 10 days?

40
15 = $\frac{1}{3}$ of 45.

*d.*60|0 = 5*s.* minus 1*d.* *Ans.* 4*s.* 11*d.*

Find the interest of *L.*30 for 70 days.

70
10 = $\frac{1}{3}$ of 30.

*d.*70|0 = 5*s.* 10*d.* minus 1*d.* *Ans.* 5*s.* 9*d*

What is the interest of *L*.65 for 60 days ?

L.65

20 = $\frac{1}{3}$ of 60 days.

130|0 = 10*s*. 10*d*. minus 2*d*. = 10*s* 8*d*. *Ans*.

Note, such part as the figure cut off is of 10, allow such part of a 1*d*.

What is the interest of *L*.75 for 33 days ?

L.75

11 = $\frac{1}{3}$ of 33 days.

82|5 = 6*s*. 10$\frac{1}{2}$*d*. minus 1*d*. *Ans*. 6*s*. 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 = 12*s*. 6*d*. minus 2*d*. *Ans*. 12*s* 4*d*.

What is the interest of *L*.145 for 37 days ?

L.145

12$\frac{1}{3}$

1740

43

178|3 = 14*s*. 10$\frac{8}{4}$*d*. minus 2$\frac{1}{2}$*d*. *Ans*. 14*s*. 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.

£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 = £1·11·4 deduct 5$\frac{1}{4}$*d*. *Ans*. £1·10·10$\frac{3}{4}$.

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 £250 for 150 days ?

£250

50 is $\frac{1}{3}$ of 150.

1250|0 = *L*.5·4·2 minus 1*s*. 5*d*. = *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 days are $\frac{1}{5}$ of a year = 2·8·0 *Ans.*

As the interest of *L*.240 for 1 year is 240*s* 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
30 is $\frac{1}{3}$ of £240.

584|0 = 584*d*. = £2·8·8
minus 0·0·8

£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 £15 for 40 days.
L.45
40

3|00)18|00

6 minus 1*d*. = $\frac{1}{4}$)*s*.5·11*d*. at 6 per cent.
1·$5\frac{3}{4}$ deduct.

Ans. *s*.4·$5\frac{1}{4}$ at $4\frac{1}{2}$ per cent.

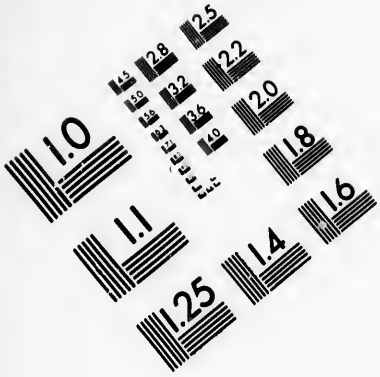
What is the interest of *L*.90 for 90 days?
£90
90

3|00)81|00

27 minus $4\frac{1}{2}d$. $\frac{1}{4}$)£1·6·$7\frac{1}{2}$ at 6 per cent.
6·$7\frac{2}{4}$

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:



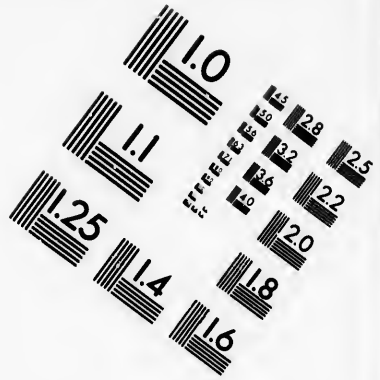
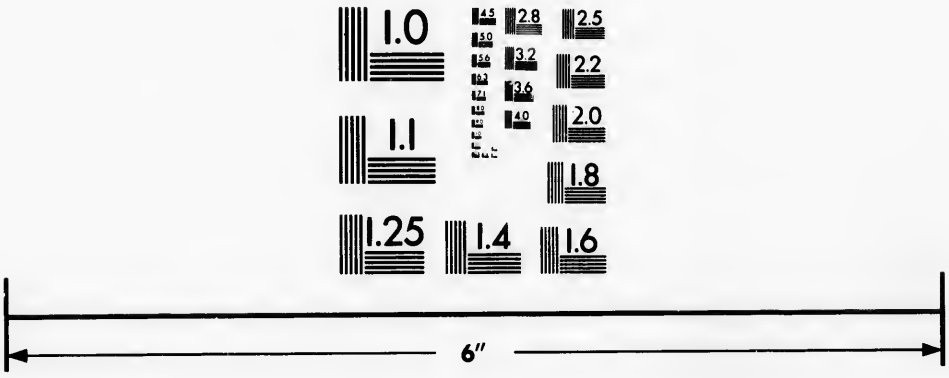
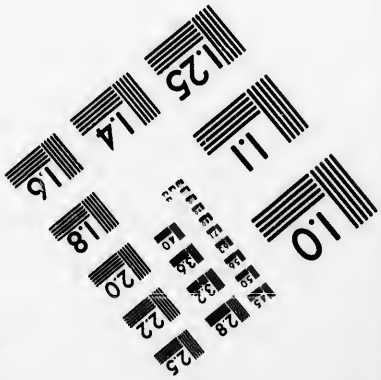


IMAGE EVALUATION TEST TARGET (MT-3)





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What is the interest of £120 for 120 days?

£120 — $\frac{1}{4}$ of 120 is 30, from 120 leaves 90
90

3|09)10|80

*s.*36 minus 6*d.* £1 . 15 . 6 at 4½ per cent. *Ans.*

The above examples will be found sufficient at 4½ per cent. for by taking $\frac{1}{3}$ from any of the examples at 6 per cent. you have at once the interest at 1½ 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?

£40
60 days.

3|00)24|00

8*s.* minus 1½*d.* $\frac{1}{3}$) *s.*7 . 10½ at 6 per cent.
2 . 7½ deduct.
*s.*5 . 3 *Ans.*

What is the interest of £50 for 65 days?

65 days
50

3|00)32|50

*s.*10 . 10*d.* minus 1¾*d.* $\frac{1}{3}$) *s.*10 . 8¼*d.* at 6 per cent.
3 . 6¾ deduct.
Ans. *s.*7 . 1½ at 4 per cent.

What is the interest of £75 for 70 days?

£75
70 days.

3|00)52|50

*s.*17 . 6 minus 3*d.* $\frac{1}{3}$) *s.*17 . 3 at 6 per cent.
5 . 9

*s.*11 . 6 *Ans.*

The above calculations may be shortened, by either taking $\frac{1}{3}$ off the amount, or off the number of days, like the following

EXAMPLE.

What is the interest of £99 for 90 days?

L.90 deduct $\frac{1}{3}$ of 90, leaves 60.
60 days.

3|00)54|00

s.18 minus 3*d*. *Ans*. 17*s*. 9*d*. 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.

3|00)32|00

s.10 . 8 minus $1\frac{3}{4}d$ *Ans*. 10*s*. $6\frac{1}{4}d$.

What is the interest of *L*.95 for 90 days?
L.95
45 = $\frac{1}{2}$ 90 days.

3|00)42|75

s.14 . 3 minus $2\frac{1}{2}d$. *Ans*. 14*s*. $0\frac{1}{2}d$.

What is the interest of £129 for 81 days, at 3 per cent?
L 129 $124\frac{1}{2}$ over, at 4*d*. the 100, allow 5*d*.
$40\frac{1}{2}$ days.

3|00)52|24$\frac{1}{2}$

s.17 . 5 minus 3*d*. *Ans*. 17*s*. 2*d*.

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 1*d*. for each 6*s*. as the other Rules.

EXAMPLES.

WHAT is the interest of *L* 30 for 20 days?

L 30
20 days.
600 at 2*d*. per 100 = 1*s*. 0*d* at 3 per cent.
add $\frac{1}{6}$ 2
Ans. *s* 1 . 2 at 3½ 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 3½ per cent?

£60
60 days
6|00)36 00
add $\frac{1}{6}$)6*s*. at 3 per cent.
1*s*.

Ans. 7*s*. minus 1¼*d*. interest 6*s*. 10¾*d*. at 3½ per cent.

What is the interest of *L*.90 for 80 days?

L.90
80 days.
6|00)72|00
add $\frac{1}{6}$)12*s*. at 3 per cent.
2

14*s*. minus 2½*d*. interest 13*s*. 9½*d*. at 3½ per cent.

What is the interest of *L* 125 for 70 days?

L.125
70 days.
6 00)87|50 350 over at 2*d*. per 100 = 7*d*.
add $\frac{1}{6}$)14 . 7
2 5
Ans. 17*s* minus 3*d*. interest 16*s*. 9*d*. at 3½ per cent

What is the interest of *L* 365 for 170 days?

L 365
170 days. 250 over = 5*d*.
6|00)620|50
add $\frac{1}{6}$)103 . 5
17 . 3 nearly.
Ans. *s*.120 . 8 minus 1*s*. 8*d*. interest £5·19 at 3½.

What is the interest of *L*.100 for 365 days, at $3\frac{1}{2}$ per cent.?

365 days.
100*L*.
6)00)365)00
add $\frac{1}{6}$)60 . 10
10 $1\frac{3}{4}$

500 at 2*d*. per 100 = 10*d*.

s.70 . $11\frac{3}{4}$ minus $11\frac{3}{4}d$. interest £3 . 10 at $3\frac{1}{2}$. Proof.

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

L.60
20 is $\frac{1}{3}$ of 60 days.

d.1200 = $\frac{1}{2}$)10*s*. at 5 per cent. minus 2*d*.

5*s*. minus 1*d*. *Ans*. 4*s*. 11*d*.

What is the interest of £95 for 33 days, at $2\frac{1}{2}$ per cent.?

£95
11 is = $\frac{1}{3}$ of 33.
1045 = $\frac{1}{2}$)8*s*. $8\frac{1}{2}d$.
4 . $4\frac{1}{4}$ minus $\frac{3}{4}d$. *Ans*. 4*s*. $3\frac{1}{2}d$.

What is the interest of £185 for 150 days?

£185
50 is $\frac{1}{3}$ of 150.

925 0 = £3 . 17 . 1
1 . 1 minus.
$\frac{1}{2}$)3 . 16 . 0 at 5 per cent.
£1 . 18 . 0 at $2\frac{1}{2}$ per cent.

It is immaterial whether the penny for every 6*s*. is taken off when at 5 per cent. or at $2\frac{1}{2}$ per cent.

What is the interest of £360 for 240 days?

£360
80 is $\frac{1}{3}$ of 240.

d 28800 = $\frac{1}{2}$)£12 . 0 . 0
6 . 0 . 0
minus 1 . 8 £5 . 18 . 4. *Ans*.

What is the interest of £395 for 37 days?

£395

$12\frac{1}{3}$ is $\frac{1}{3}$ of 37 days.

4740

$131\frac{2}{3}$

$d.487|1\frac{2}{3} = \frac{1}{2})$ £2 . 0 . 7

1 . 0 . $3\frac{1}{2}$

minus $3\frac{1}{2}$ £1. *Ans.*

If the figure cut off were 5, the allowance for it would be $\frac{1}{2}d.$ consequently $1\frac{2}{3}$ can be of no value.

What is the interest of £100 for 365 days?

365 days.

$33\frac{1}{3}$

12045

$121\frac{2}{3}$

$1216|6 = \frac{1}{2})$ £5 . 1 . $4\frac{1}{2}$

2 . 10 . $8\frac{1}{4}$

$8\frac{1}{4}$ minus. £2 . 10. 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 $30\frac{5}{12}$, 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?

365 days
100

7300)36500(£5 *Ans.*
....

What is the interest of £120 for 95 days?

95 days,
120

	L.	*s.*	*d.*
7300)11400	(1	· 11	· $2\frac{3}{4}$ at 5 per cent.
365)4100			
450			
3 | 0)8 | 5			

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.

95 days.
40 is $\frac{1}{3}$ of £120.

d 380 \| 0 = £1·11·8.
minus $5\frac{1}{4}d$. Interest £1·11·$2\frac{3}{4}$

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?

£30

10 is $\frac{1}{3}$ of 30.

3|00)3|00

s. 1 *Ans.* at 2 per cent.

What is the interest of *L.*75 for 84 days, at 2 per cent.?

84

25 is $\frac{1}{3}$ of 75.

3|00)21|00

*s.*7 minus $1\frac{1}{4}d.$ *Ans.* 6*s.* $10\frac{3}{4}d.$

What is the interest of *L.*95 for 120 days?

£95

40 is $\frac{1}{3}$ of 120.

3|00)38|00 200 over = 8*d.*

*s.*12·8*d.* minus 2*d.* *Ans.* 12*s.* 6*d.*

What is the interest of £110 for 99 days?

£110

33

3|00)36|30 30 over = 1*d.*

*s.*12 · 1 minus 2*d.* *Ans.* 11*s.* 11*d.*

What is the interest of *L* 130 for 130 days?

*L.*130

130

3|00)169|00

$\frac{1}{3}$)56 · 4 at 6 per cent.

*s.*18 . $9\frac{1}{4}$ minus 3*d.* *Ans.* 18*s.* $6\frac{1}{4}d.$

What is the interest of £195 for 150 days?

£195

50 is $\frac{1}{3}$ of 150.

3|00)97|50

*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 1*s.* 5½*d.* *Ans.* £5-3-10½.

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 1½ 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 ½ per cent. by taking $\frac{1}{2}$ 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.

From	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.?

£65 — 40 mo. = yrs. mo. to 3 · 4

260|0 = £13 · 0 · 0
4 · 3¼
£13 · 4 · 3¼ *Ans.*

£65 — 20 days.

3|00)13|00

4 · 4 minus ¾*d.*

What is the interest of £85 for 4 years, 2 months, and 24 days, at 4 per cent.?

£85 × 50 = 425|0

£ *s.* *d.*
21 · 5 · 0
6 · 8½

£85 × 24

3|00)20|40

6 · 9½

deduct ⅓)21 · 11 · 8½ at 6 per cent. 1*d.* minus.
for 4 p c. 7 · 3 · 11 at 2 per ct. being ⅓ of 6 per cent.

£14 · 7 · 9½ at 4 per cent.

What is the interest of £90 · 7 · 6 for 6 years, 8 months and 24 days at 5 per cent.?

yrs. mo. *s.* *d.* — 6 · 8 as 6 · 8 is ⅓) £ *s.* *d.* 90 · 7 · 6

interest for 6 yrs. 8 mo. 30 · 2 · 6
interest for 24 days 5 · 11¼
£30 · 8 · 5¼

90 · 7 · 6 × 8 = 72|3 · 0 · 0

s. *d.*
= 6 · 0¼ minus 1*d.*

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

£7.13.10$\frac{10}{13}$ *Ans.* which is nearly 7$\frac{3}{4}$ 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. £6$\frac{2}{3}$ 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. £6$\frac{1}{4}$ per cent. and the purchase money is £2000.

If 21 years' purchase money is given fer £190 per annum, what per cent. has the purchaser for his money?

21) £100

Ans. £4.15.2$\frac{6}{7}$ 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. £3.11.5$\frac{1}{7}$ 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

25 the number of years' purchase.
100 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

$16\frac{2}{3}$ the number of years' purchase.
100

£1600·13·4 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£

30 years' purchase.
100

£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.?

$3\frac{1}{2}$ 150£
2 2

7) 300

$42\frac{6}{7}$ years' purchase.
100

£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 2½ per cent. may be gained by the money laid out?

2½ 500£.
2 2

5)1000

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 £2½ 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, 1831, the banker advancing the sum of £100 and proceeding as follows:

1834.	£	Sums due. £	No. of Days.	Products.
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 per cent.

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. *Prod.*

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 30*s.* 3*d.*, from which 5*d.* being deducted, there being 5 times 6*s.* 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.	£		*Days.*	*Prod.*
Jan. 15, adva	123	from Jan. 15 to 31st	16	=1968
31, recd.	75			
due	48	from Jan. 31 to Feb. 10	10	= 480
Feb. 10, paid	90			
due	138	from Feb. 10 to 22,	12	=1656
.... 22, paid	47			
due	185	from Feb. 22 to Mar. 3	10	=1350
Mar. 3, recd.	100			
due	85	from March 3 to 23	20	=1700
.... 23, paid	55			
due	140	from Mar. 23 to Apr. 4	12	=1680
April 4, recd.	100			
due	40	from Apr. 4 to May 4	30	=1200
May 4, recd.	40		3|00)	105|34
				35 . $1\frac{1}{2}$
		deduct		$5\frac{3}{4}$

May 4. Interest due at 6 per cent. £1 . 14 . $7\frac{3}{4}$

At 5 per cent. deduct $\frac{1}{6}$ ..... 5 . $9\frac{1}{4}$

At 5 per cent. £1 . 8 . $10\frac{1}{2}$

1834.	£	Sums due. £	No. of Days.	Products.
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

$\frac{1}{3}$)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 ent. and by taking the $\frac{1}{3}$ of 6 you have 2 per cent. bserving to take one penny for each six shillings off ach 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 Days.	Products.
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

a deduction of a penny for each shilling; consequently the correct answer is £9·16·10. If preferred, the interest may be found at 6 per cent. as in the preceeding examples, and $\frac{1}{10}$th deducted from that sum leaves the answer at 5 per cent.

DISCOUNT.

It being customary for manufacturers to take off a certain discount (extending from $2\frac{1}{2}$ to 75 per cent.) from the price of articles purchased, the following methods will, we trust, be found useful.

Rule.—If the Discount to be taken off is any aliquot part of a 100, take that part of the gross sum which will be the discount, which being subtracted from the gross sum leaves the net money, or the money to be paid after taking of the discount.

EXAMPLES

where the discount is an even part of 100.

What discount should be taken off £145·3·4 at $2\frac{1}{2}$ per cent.?

$2\frac{1}{2}$ of 100 is $\frac{1}{40}$) £145· 3·4

3·12·7 disc. taken off at $2\frac{1}{2}$ per cent.

£141·10·9 net money to be paid.

Take the discount off £203·7·10 at 5 per cent.

5 of 100 is $\frac{1}{20}$) £203·7·10

10·3· $4\frac{7}{10}$ discount.

£193·4· $5\frac{3}{10}$ net money.

As 5 per cent is 1*s.* in the *L.* &c. &c. we shall give as we proceed more simple Rules when applicable; but such sums as the preceding, to be perfectly accurate, should be done by the foregoing methods.

What discount should be taken off *L*372·9·2 at 10 per cent.?

10 of 100 is $\frac{1}{10}$) £372·9· 2

37·4·11 discount.

£335·4· 3 net money.

Take the discount off £160·17·8 at 12½ per cent.

12½ of 100 is ⅛) £160·17·8

20· 2·2½ discount.

£140·15·5½ net money

Find the discount on £6580·0·10 at 20 per cent.

20 of 100 is ⅕) £6580·0·10

1316·0· 2 discount.

£5264·0· 8 net money.

What is the discount on £17·3·2 at 25 per cent.?

25 of 100 is ¼) £17·3·2

4·7·0½ discount.

£13·1·1½ net money.

What is the discount on 7s. 10½d. at 50 per cent.?

50 of 100 is ½) 7s. 10½d.

3s. 11¼ discount or net money

Find the discount on £18·9·10 at 75 per cent.

75 of 100 is ¾) £18· 9·10

4·12· 5½ net money.

£13·17· 4½ discount.

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.

20)325·8·3

16·5·4 $\frac{15}{20}$ discount at 5 per cent.

multiply by 3 as there are 3 times in 15.

£48·16·2 $\frac{5}{20}$ or $\frac{3}{4}d.$ disc. at 15 per cent.

By this method the exact fraction is discovered which every person is at liberty to follow as they wish.

What is the discount on 4*s*. 10*d*. at 35 per cent.?

20) 4*s*. 10*d*.

$2\frac{9}{10}$ at 5 per cent.
7

s.1·8$\frac{3}{10}$ at 35 per cent.

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.

£7·8·4	The £22 as shillings are = £1·2,
3	and the 5 in the shillings being $\frac{1}{4}$ of
£22·5·0	a £ allow 3*d*. the $\frac{1}{4}$ of a shilling.
	Ans. £1·2·3.

Find the discount on £27·3·10 at 17$\frac{1}{2}$ per cent.

£27·3·10	The *L*.95 as shillings = *L*.4·15
3$\frac{1}{2}$	and as 3*s*. 4*d*. is just $\frac{1}{6}$ of a pound,
81·11· 6	allow the $\frac{1}{6}$ of a shilling, = 2*d*.
13·11·11	*Ans*. £4·15·2.
L.95· 3· 5	

Find the discount on *L*.150·14·2 at 31$\frac{1}{4}$ per cent.

L.150·14·2	This 31$\frac{1}{4}$ contains 6$\frac{1}{4}$ times 5,
6$\frac{1}{4}$	and the *L*.941 produced as shil-
904· 5·0	lings, *L*.47·1 and the proportion
37·13·6$\frac{1}{2}$	that the 18*s*. 6$\frac{1}{2}$*d*. bears to a *L* is
£941·18·6$\frac{1}{2}$	the same, or a little better, than
	that 11*d*. bears to a shilling.
	Ans. *L*.47·1·11 at 31$\frac{1}{4}$ per cent.

* 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.

℔ cent.	In the £	℔ cent	In the £	℔ cent.	In the £
$\frac{1}{8}$ is	$0s.\ 0\frac{1}{10}d.$	$16\frac{1}{4}$ is	$3s.\ 3d.$	$37\frac{1}{2}$ is	$7s.\ 6$
$\frac{1}{4}$ is	$0\ \ 0\frac{1}{5}$	$17\frac{1}{2}$ 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 at 5 per cent.
6

L.37·10 at 30 per cent.

What is the discount on *L*.28·10 at 45 per cent.

L.1·8·6 at 5 per cent.
9

L.12·16·6 at 45 per cent.

What is the discount on *L*.128·2·6 at 70 per cent.?

L.6·8·$1\frac{1}{2}$ at 5 per cent.
14

L.89·13·9 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 ?

25|00 francs
4

Ans. *L*.100 British.

In 2600 francs how many pounds ?

26|00 francs.
4

Ans. *L*.104 British.

In 2720 francs how many pounds ?

27|20 francs.
4

L.108 and 20 francs over = *L*.108·16. *Ans*

In 810 francs how many pounds ?

8|10 francs.
4

L.32 and 10 francs over = *L* 32·8. *Ans.*

In 3500 francs how many pounds ?

35|00 francs.
4

L.140 British. *Ans.*

In 5624 francs how many pounds ?

56|24 francs.
4

L.224 and 24 francs = *L*.224·19·2$\frac{2}{5}$. *Ans.*

In 1805 francs how many pounds ?

18|05 francs.
4

L.72 and 5 francs = *L*.72·4. *Ans*.

A franc being 9$\frac{1}{2}$*d*. English, 5 must be 4*s*.

In 2026 francs how many pounds ?

20|26 francs.
4

L.80 and 26 francs.

26 francs = 1 . 0 . 9$\frac{1}{2}$

L.81 . 0 . 9$\frac{1}{2}$ English. *Ans*.

In 20000 francs how many pounds ?

200|00 francs.
4

L.800 British. *Ans*.

In 1000000 francs how many pounds ?

10000|00 francs.
4

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 . 8 how many francs ?

4)*L*.32·8

---

800 francs.
8*s*. over = 10 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?

4)£224

5600

19*s.* $2\frac{2}{3}$*d.* = 24 francs.

5624 francs. *Ans.*

In £72 . 4 how many francs?

4)£72 . 4

1800

4*s.* = 5 francs.

1805 francs. *Ans.*

In £81 . 0 . $9\frac{3}{4}$. how many francs?

4)£81 . 0 . $9\frac{3}{4}$.

2000

*L.*1 . 0 . $9\frac{3}{4}$. = 26 francs.

2026 francs. *Ans.*

In *L.*800 British how many francs?

4)*L.*800

20000 francs. *Ans.*

In *L.*40000 how many francs?

4)*L.*40000

1000000 francs. *Ans.*

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?

24*ft.* as 24*d.* = 2*s.*

11

22 feet. *Ans.*

A board 16 *ft.* long, 10 *in.* broad and 1 *in.* thick, how many feet?

1 *ft.* 4 *in.*
10

ft. 13·4 *in.* *Ans.*

A board 23½ *ft.* long, 11 *in.* broad and 1 *in.* thick, how many feet?

1 *ft.* 11½ in.
11

ft. 21·6½ *in.* *Ans.*

A board 29¾ *ft.* long, 8 *in.* broad and 1 *in.* thick, how many feet?

2 *ft.* 5¾ *in.*
8

ft. 19·10 *in.* *Ans.*

A plank measuring 30 *ft.* long, 9 *in.* broad and 2 *in.* thick, how many feet?

2 *ft.* 6 *in.*
9

ft. 22·6 *in.* if 1 *in.* thick.
2

ft. 45·0 *in.* *Ans.*

Three planks, 29 *ft.* long each, 7½ *in.* broad and 2 *in* thick, how many feet?

7 *ft.* 3 *in.*
15

ft. 108·9 *in.* *Ans.*

The thickness being 2 *in.* I multiply by 15 in preference to 7½ first, and that product by 2.

Four planks, each 15 *ft.* long, 9½ *in.* broad and 3 *in.* thick, how many feet?

5 *ft.*
9½

47½
3

ft. 142½ *Ans*

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 43 yards cost at 7*d.* per yard?

43 at 1*d.* amount to 4*s.*
multiplied by 7*d.* the price.

£1·8 *Ans.*

What would 43 *lbs.* cost at 8*d.* per *lb*?

43 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 ?

84 ounces at 1*d.* amount to 7*s.*
multiplied by 6*d.* the price.

£2 . 2 *Ans.*

What will 96 gallons come to at 7*d.* per gallon ?

96 gallons at 1*d.* amount to 8*s.*
multiplied by 7*d.* the price.

£2.16 *Ans.*

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.*

48 *lbs.* at 1*d.* amount to 4*s.*
multiplied by $5\frac{1}{2}$

£1.2 *Ans.*

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 ?

72 yards at 1*d.* = 6*s.*
multiplied by $6\frac{1}{2}$

£1.19 *Ans.*

What will 96 yards cost at $7\frac{1}{2}d.$ per yard ?

96 yards at 1*d.* amount to 8*s.*
multiplied by $7\frac{1}{2}$

*s.*60 *Ans.*

What would 120 gallons cost at $10\frac{1}{2}d.$ per gallon ?

120 gallons at 1*d.* amount to 10*s.*
multiply by $10\frac{1}{2}$

£5.5 *Ans.*

Note, Should $\frac{1}{4}$ occur in the price when calculating

mentally, take $\frac{1}{4}$th of what it comes to at 1*d.* which add in as the following

EXAMPLES.

What would 96 ounces cost at $8\frac{1}{4}d.$ per ounce ?

96 at 1*d* amount to 8*s.*
multiply by $8\frac{1}{4}$

£3·6 *Ans.*

Here we say 96 at 1*d.* comes to 8*s.* 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 £3·6*s.* the price at $8\frac{1}{4}d.$

What would 103 ounces cost at $9\frac{1}{4}d.$ per ounce ?

103 ounces at 1*d.* amount to 9*s.*
multiply by $9\frac{1}{4}$

£4·3·3 *Ans.*

What would 120 gallons cost at $10\frac{1}{4}d.$ per gallon ?

120 gallons at 1*d.* amount to 10*s.*
multiply by $10\frac{1}{4}$

£5·2·6 *Ans.*

Note, Should $\frac{3}{4}d.$ occur in the price when calculating mentally, take 3 quarters of what it comes to at 1*d.* which add as in the following

EXAMPLES.

Suppose 96 gallons at $2\frac{3}{4}d.$ per gallon.

96 gallons at 1*d.* amount to 8*s.*
multiply by $2\frac{3}{4}$

£1·2 *Ans.*

Note, In this question 96 at a 1*d.* amount to 8*s.* which being multiplied by 2, gives 16*s.* then the 3 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 114 *lbs.* cost at $5\frac{3}{4}d.$ per *lb.*?

114 *lbs.* at 1*d.* amount to 12*s.*
multiply by $5\frac{3}{4}$

£3·9·0 *Ans.*

What will 84 gallons cost at $7\frac{1}{4}d.$ per gallon?
84 at 1*d.* amounts to 7*s.*
multiply by $7\frac{1}{4}$

£2·10·9 *Ans.*

What will 132 ounces cost at $10\frac{1}{2}d.$ per ounce?
132 at 1*d.* amount to 11*s.*
multiply by $10\frac{1}{2}$

£5·15·6 *Ans.*

Suppose 108 yards at $10\frac{3}{4}d$ per yard?
108 at 1*d.* amount to 9*s.*
multiply by $10\frac{3}{4}$

£4·16·9 *Ans.*

Having given many examples in Mental Calculations, with explanatory notes, we think a table of that description may be acceptable to Principals of Seminaries, as also the Heads of Families to exercise the young Pupil in, they being calculated to strengthen the memory, and much facilitate their power of solving Questions in the mind.

Table of Calculations to be answered Mentally.

yds.	*per yd.* s.	d.	*Answers* £	s.	d.
24 at	0	3	0	6	0
24 at	0	4	0	8	0
24 at	0	5	0	10	0
24 at	0	6	0	12	0
24 at	0	7	0	14	0
24 at	0	8	0	16	0
24 at	0	9	0	18	0
24 at	0	10	1	0	0
24 at	0	11	1	2	0
lbs.	*per lb.*				
36 at	0	3	0	9	0
36 at	0	4	0	12	0
36 at	0	5	0	15	0
36 at	0	6	0	18	0
36 at	0	7	1	1	0
36 at	0	8	1	4	0

lbs.	*per lb.* s.	d.	*Answers.* £.	s.	d.
36 at	0	9	1	7	0
36 at	0	10	1	10	0
36 at	0	11	1	13	0
gals.	*per gal.*				
37 at	0	1	0	3	1
37 at	0	2	0	6	2
37 at	0	3	0	9	3
37 at	0	4	0	12	4
37 at	0	5	0	15	5
37 at	0	6	0	18	6
37 at	0	7	1	1	7
37 at	0	8	1	4	8
37 at	0	9	1	7	9
37 at	0	10	1	10	10
37 at	0	11	1	13	11

In the following table a halfpenny is introduced in the price.

lbs.	*per lb.* s.	d.	*Answers.* £	s.	d.
48 at	0	1	0	4	0
48 at	0	3	0	12	0
48 at	0	3½	0	14	0
48 at	0	4	0	16	0
48 at	0	4½	0	18	0
48 at	0	5	1	0	0
48 at	0	5½	1	2	0
48 at	0	6	1	4	0
48 at	0	6½	1	6	0
48 at	0	7	1	8	0
48 at	0	7½	1	10	0
48 at	0	8	1	12	0
48 at	0	8½	1	14	0
48 at	0	9	1	16	0
48 at	0	9½	1	18	0
48 at	0	10	2	0	0
48 at	0	10½	2	2	0
48 at	0	11	2	4	0
48 at	0	11½	2	6	0
stones.	*per stone.*				
60 at	0	1	0	5	0
60 at	0	3	0	15	0
60 at	0	3½	0	17	6
60 at	0	4	1	0	0
60 at	0	4½	1	2	6
60 at	0	5	1	5	0
60 at	0	5½	1	7	6
60 at	0	6	1	10	0
60 at	0	6½	1	12	6
60 at	0	7½	1	17	6
60 at	0	8	2	0	0
60 at	0	8½	2	2	6
60 at	0	9	2	5	0
60 at	0	9½	2	7	6
60 at	0	10	2	10	0
60 at	0	10½	2	12	6
60 at	0	11	2	15	0
60 at	0	11½	2	17	6

gals.	*per gal.* s.	d.	*Answer.* £	s.	d.
72 at	0	1	0	6	0
72 at	0	3	0	18	0
72 at	0	3½	1	1	0
72 at	0	4	1	4	0
72 at	0	4½	1	5	6
72 at	0	5½	1	13	0
72 at	0	6¼	1	17	6
72 at	0	7½	2	5	0
72 at	0	8¼	2	9	6
72 at	0	9½	2	17	0
72 at	0	10	3	0	0
72 at	0	10¼	3	1	6
72 at	0	10½	3	3	0
72 at	0	11	3	6	0
72 at	0	11¼	3	7	6
72 at	0	11½	3	9	0
stones.	*per stone.*				
84 at	0	1	0	7	0
84 at	0	3	1	1	0
84 at	0	3½	1	4	6
84 at	0	4	1	8	0
84 at	0	4½	1	11	6
84 at	0	5	1	15	0
84 at	0	5½	1	18	6
84 at	0	6	2	2	0
84 at	0	6¼	2	3	9
84 at	0	6½	2	5	6
84 at	0	7	2	9	0
84 at	0	7½	2	12	6
84 at	0	8¼	2	17	9
84 at	0	9	3	3	0
84 at	0	9½	3	6	6
84 at	0	10	3	10	0
84 at	0	10½	3	13	6
84 at	0	11	3	17	0
84 at	0	11½	4	0	6
oz.	*per oz.*				
96 at	0	1	0	8	0
96 at	0	3	1	4	0
96 at	0	3¼	1	6	0
96 at	0	3½	1	8	0

per oz.				*Answers.*			*per lb.*				*Answers.*		
oz.		*s.*	*d.*	£	*s*	*d*	*lbs.*		*s.*	*d.*	£	*s.*	*d.*
96	at	0	$3\frac{1}{4}$	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	$5\frac{1}{4}$	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	$8\frac{1}{2}$	4	5	0
96	at	0	$10\frac{1}{4}$	4	2	0	120	at	0	$8\frac{3}{4}$	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	$11\frac{1}{2}$	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
gals.		*per*	*gal.*				120	at	0	$11\frac{1}{2}$	5	15	0
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	$8\frac{1}{4}$	3	18	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	6	132	at	0	10	5	10	0
lbs.		*per*	*lb.*				132	at	0	$10\frac{3}{4}$	5	18	3
120	at	0	1	0	10	0	132	at	0	11	6	1	0
120	at	0	3	1	10	0	132	at	0	$11\frac{1}{2}$	6	6	6
120	at	0	$3\frac{1}{4}$	1	12	6	*oz.*		*per*	*oz.*			
120	at	0	$3\frac{1}{2}$	1	15	0	144	at	0	1	0	12	0
120	at	0	$3\frac{3}{4}$	1	17	6	144	at	0	3	1	16	0
120	at	0	4	2	0	0	144	ar	0	$3\frac{1}{4}$	1	19	0

lb.	Answers.	
d.	£	s. d.
$4\frac{1}{4}$	2	2 6
5	2	10 0
$5\frac{1}{4}$	2	12 6
$6\frac{1}{2}$	3	5 0
$6\frac{3}{4}$	3	7 6
7	3	10 0
$7\frac{1}{4}$	3	12 6
$7\frac{1}{2}$	3	15 0
$7\frac{3}{4}$	3	17 6
8	4	0 0
$8\frac{1}{4}$	4	2 6
$8\frac{1}{2}$	4	5 0
$8\frac{3}{4}$	4	7 6
9	4	10 0
$9\frac{1}{2}$	4	15 0
$10\frac{3}{4}$	5	7 6
11	5	10 0
$11\frac{1}{2}$	5	15 0
1	0	11 0
3	1	13 0
$3\frac{1}{2}$	1	18 6
$3\frac{3}{4}$	2	1 3
4	2	4 0
$4\frac{1}{4}$	2	6 9
5	2	15 0
$5\frac{1}{2}$	3	0 6
$5\frac{3}{4}$	3	3 3
7	3	17 0
$7\frac{1}{4}$	3	19 9
$8\frac{1}{2}$	4	13 6
9	4	19 0
$9\frac{1}{4}$	5	1 9
10	5	10 0
$10\frac{3}{4}$	5	18 3
11	6	1 0
$11\frac{1}{2}$	6	6 6

er oz.		
1	0	12 0
3	1	16 0
$3\frac{1}{4}$	1	19 0

	per lb.		Answers.		
lbs.		s.	d.	£	s. d.
144	at	0	$3\frac{1}{2}$	2	2 0
144	at	0	$3\frac{3}{4}$	2	5 0
144	at	0	4	2	3 0
144	at	0	$4\frac{1}{2}$	2	14 0
144	at	0	$4\frac{3}{4}$	2	17 0
144	at	0	5	3	0 0
144	at	0	$5\frac{1}{4}$	3	3 0
144	at	0	$5\frac{1}{2}$	3	6 0
144	at	0	$5\frac{3}{4}$	3	9 0
144	at	0	7	4	4 0
144	at	0	$7\frac{1}{4}$	4	7 0
144	at	0	$7\frac{1}{2}$	4	10 0
144	at	0	$7\frac{3}{4}$	4	13 0
144	at	0	8	4	16 0
144	at	0	$8\frac{1}{4}$	4	18 0
144	at	0	$9\frac{1}{2}$	5	14 0
144	at	0	$10\frac{3}{4}$	6	9 0
144	at	0	11	6	12 0
144	at	0	$11\frac{3}{4}$	7	1 0

oz.	per oz.	
37	at	5
40	at	6
48	at	$6\frac{1}{2}$
60	at	$7\frac{1}{4}$
72	at	$7\frac{3}{4}$
84	at	$8\frac{1}{2}$
90	at	10
96	at	$10\frac{3}{4}$
100	at	4
102	at	9
120	at	[illegible]
121	[illegible]	[illegible]
126	at	[illegible]
152	at	$8\frac{3}{4}$
144	at	$9\frac{3}{4}$
25	at	3
16	at	3
26	at	9

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.

	per yd.		Answers.		
yds.		s.	d.	£.	s. d.
60	at	1	0	3	0 0
60	at	2	0	6	0 0
60	at	3	0	9	0 0
60	at	4	0	12	0 0
60	at	5	0	15	0 0

	per yd.		Answers.		
yds.		s.	d.	£.	s. d.
60	at	6	0	18	0 0
60	at	7	0	21	0 0
60	at	8	0	24	0 0
60	at	9	0	27	0 0
60	at	10	0	30	0 0

yds.	per yd. s.	d.	Answers £.	s.	d.
60 at	11	0	33	0	0
60 at	12	0	36	0	0
80 at	1	0	4	0	0
80 at	3	0	12	0	0
*80 at	3	3	13	0	0
80 at	3	6	14	0	0
80 at	4	0	16	0	0
80 at	4	3	17	0	0
80 at	4	6	18	0	0
80 at	4	9	19	0	0
80 at	5	0	20	0	0
80 at	5	3	21	0	0
80 at	5	6	22	9	0
80 at	5	9	23	0	0
80 at	6	0	24	0	0
80 at	6	3	25	0	0
80 at	6	6	26	0	0
80 at	6	9	27	0	0
80 at	7	0	28	0	0
80 at	7	3	29	0	0
80 at	8	6	34	0	0
80 at	9	0	36	0	0
80 at	10	9	43	0	0
80 at	11	0	44	0	0
80 at	11	6	46	0	0
80 at	12	0	48	0	0
100 at	3	0	15	0	0
100 at	3	6	17	10	0
100 at	4	0	20	0	0
100 at	4	1	20	8	4

In the above, the 100 at 1*s.* is £5. at 4*s.* amount to £20, in addition to which 100 at 1*d.* = 8*s.* 4*d.* give £20·3·4.

yds.	per yd. s.	d.	Answers £.	s.	d.
100 at	5	0	25	0	0
100 at	5	6	27	10	0
100 at	6	0	30	0	0
100 at	6	1	30	8	4
100 at	6	3	31	5	0
100 at	7	0	35	0	0
100 at	8	3	41	5	0
100 at	8	6	42	10	0
100 at	9	1	45	8	4
100 at	10	2	50	16	8
100 at	10	6	52	10	0
100 at	11	3	56	5	0
100 at	12	0	60	0	0
100 at	12	2	60	16	8
100 at	12	9	63	15	0
120 at	3	0	18	0	0
120 at	3	6	21	0	0
120 at	4	3	25	10	0
120 at	4	9	28	10	0
120 at	5	0	30	0	0
120 at	5	3	31	10	0
120 at	6	6	39	0	0
120 at	7	0	42	0	0
120 at	7	3	43	10	0
120 at	8	9	52	10	0
120 at	9	0	54	0	0
120 at	9	3	55	10	0
120 at	10	9	64	10	0
120 at	11	1	66	10	0
120 at	11	6	69	0	0
120 at	12	0	72	0	0
120 at	12	6	75	0	0
130 at	1	0	6	10	0
130 at	3	0	19	10	0
130 at	4	0	26	0	0

* Here 80 at 1*s.* = £4.
multiplied by $3\frac{1}{4}$
gives the *Ans* £13.

yds.	per yd. s.	d.	Answers. £.	s.	d.
130 at	5	0	32	10	0
130 at	6	0	39	0	0
130 at	7	0	45	10	0
130 at	8	0	52	0	0
130 at	9	0	58	10	0
130 at	10	0	65	0	0
130 at	11	0	71	10	0
130 at	12	0	78	0	0
140 at	3	0	21	0	0
140 at	3	6	24	10	0
140 at	4	0	28	0	0
140 at	4	3	29	15	0
140 at	4	6	31	10	0
140 at	5	3	36	15	0
140 at	6	6	45	10	0
140 at	7	3	50	15	0
140 at	8	0	56	0	0
140 at	8	1	56	11	8
140 at	8	6	59	10	0
140 at	9	0	63	0	0
140 at	9	1	63	11	8
140 at	9	3	64	15	0
140 at	9	6	66	10	0
140 at	10	3	71	15	0
140 at	10	9	75	5	0
140 at	11	0	77	0	0
140 at	11	1	77	11	8
140 at	11	6	80	10	0
140 at	12	0	84	0	0
140 at	12	6	87	10	0
160 at	3	0	24	0	0
160 at	3	6	28	0	0
160 at	4	0	32	0	0
160 at	4	1	32	13	4
160 at	4	3	34	0	0
160 at	4	6	36	0	0
160 at	4	9	38	0	0
160 at	5	0	40	0	0
160 at	5	3	42	0	0

yds.	per yd. s.	d.	Answers. £	s.	d.
160 at	6	9	54	0	0
160 at	7	0	56	0	0
160 at	7	1	56	13	4
160 at	7	3	58	0	0
160 at	7	6	60	0	0
160 at	9	9	78	0	0
160 at	10	3	82	0	0
160 at	10	6	84	0	0
160 at	10	9	86	0	0
160 at	11	0	88	0	0
160 at	11	1	88	13	4
160 at	11	3	90	0	0
160 at	11	6	92	0	0
160 at	11	9	94	0	0
160 at	12	0	96	0	0
160 at	12	3	98	0	0
180 at	3	0	27	0	0
180 at	3	6	31	10	0
180 at	3	9	33	15	0
180 at	4	0	36	0	0
180 at	4	1	36	15	0
180 at	4	2	37	10	0
180 at	4	3	38	5	0
180 at	4	6	40	10	0
180 at	5	0	45	0	0
180 at	5	3	47	5	0
180 at	5	6	49	10	0
180 at	6	9	60	15	0
180 at	7	0	63	0	0
180 at	7	3	65	5	0
180 at	7	6	67	10	0
180 at	7	9	69	15	0
180 at	8	0	72	0	0
180 at	8	1	72	15	0
180 at	8	3	74	5	0
180 at	9	0	81	0	0
180 at	9	6	85	10	0
180 at	10	3	92	5	0
180 at	11	0	99	0	0
180 at	11	6	103	10	0

yds.	per yd. s.	d.	Answers. £.	s.	d.	yds.	per yd. s.	d.	Answers. £.	s.	d.
180 at	12	0	108	0	0	200 at	11	6	115	0	0
						200 at	12	0	120	0	0
200 at	3	0	30	0	0	200 at	12	6	125	0	0
200 at	3	3	32	10	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 96 yards cost at 5*d.* per yard?

Ans. 10*s.* 10*d.*

What will 2 ½ *lbs.* cost at 7*d.* per *lb* ?

Ans. £1 . 0 . 1½

What will $55\frac{1}{4}$ gallons cost at 8*d.* per gallon?
Ans. £1·16·10.

What will $126\frac{3}{7}$ stone cost at 9*d.* per stone?
Ans. £4·15·$0\frac{3}{7}$.

What will $118\frac{1}{8}$ ounces cost at 10*d.* 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 $8\frac{1}{2}d.$ per *lb.*?
Ans. £5·4·$10\frac{1}{2}$.

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 1*d.* and multiplied by the price.

EXAMPLES.

The price of each of the following is to be found at 1*s.* and multiplied by the price.

What will 44 gallons cost at 11*s.* per gallon?
Ans. £24·4·0.

What will 96 yards cost at 9*s.* per yard?
Ans. £43·4.

What will 97 yards cost at 7*s.* per yard?
Ans. £33·19·0.

What will $89\frac{1}{4}$ gallons cost at 8*s.* per gallon?
Ans. £35·14·0.

What will $91\frac{1}{2}$ ounces cost at 9*s.* per ounce?
Ans. £41·3·6.

What will $93\frac{3}{4}$ yards cost at 7*s.* per yard?
Ans. £32·16·3.

What will $104\frac{1}{8}$ ounces cost at 10*s.* per ounce?
Ans. £52·1·3.

What will 41 yards cost at 4*s.* 1*d.* per yard?
Ans. £8·19·8.

What will 66 yards cost at 5*s.* 2*d.* per yard?
Ans. £17·1·0.

What will $91\frac{1}{2}$ gallons cost at 8*s.* 1*d.* per gallon?
Ans. £36·19·$7\frac{1}{2}$.

What will 110¼ ounces cost at 8*s*. 2*d*. per ounce?

£5 . 10 . 3 at 1*s*.

8 2 13*s*. 4½*d*. to bring in.

£45 . 0 . 4½. *Ans*.

All the above should be done in one line, by the above method.

What would 80 yards cost at 3*s*. 3*d*. per yard?

£4

3¼

£13 *Ans*.

What would 84 gallons cost at 5*s*. 6*d*. per gallon?

Ans. £23 . 2.

What would 90 yards cost at 6*s*. 9*d*. per yard?

Ans. £30 . 7 . 6.

What will 124 gallons cost at 10*s*. 3*d*. per gallon?

Ans. £63 . 11.

What will 145½ ounces cost at 11*s*. 3*d*. per ounce?

Ans. £81 . 16 . 10½.

What will 163¾ yards cost at 12*s*. 6*d*. per yard?

£8 . 3 . 9

12½ £4 . 1 . 10½. to bring in.

£102 . 6 . 10½ *Ans*.

What will 181½ yards cost at 11*s*. 3*d*. per yard?

Ans. £102 . 1 . 10½.

What will 204¾ stones cost at 7*s*. 9*d*. per stone?

Ans. £79 . 6 . 9¾.

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 7*s*. 3*d*. each?

£4 . 7

2

£8 . 14 *Ans*.

What will 132 articles cost at 3*s*. 9½*d* each?

£5 . 5 . 6
11

£58 . 0 . 6 *Ans.*

What will 193 articles cost at 15*s*. 7¾*d* each?
Ans £84 . 9 . 9.

What will 72 articles cost at 3*s*. 10½*d*. each?
Ans. £13 . 19.

What will 84 articles cost at 5*s*. 6⅓*d*. each?
Ans. £23 . 16 . 10½.

What will 102 articles cost at 12*s*. 8½*d* each?

£7 . 12 . 6 the price of 1 dozen.
8⅓ dozen, being = 102.

£64 . 16 . 3 *Ans.*

What will 147 articles cost at 17*s*. 10¾*d*. each?

£10 . 14 . 9
12¼ £2 . 13 . 3¼ to bring in.

L.131 . 10 . 3¼ *Ans.*

What will 181 articles cost at 16*s*. 8¾*d* each?

*L*10 . 0 . 9
15 16*s*. 8¾*d*. price of 1 to bring in.

L 151 . 7 . 11¾ *Ans.*

MISCELLANEOUS EXAMPLES.

2 *cwt*. 2 *qrs*. 24 *lbs*.	at	5*d*.	per *lb*.	*Ans.*	£6	6	8
2 *cwt*. 3 *qrs*. 14 *lbs*.	at	6*d*	per *lb*.	*Ans.*	£3	1	0
3 *cwt*. 3 *qrs*. 12 *lbs*.	at	6½*d*.	per *lb*.	*Ans.*	£11	14	0
3 *cwt*. 3 *qrs*. 24 *lbs*.	at	7*d*.	per *lb*.	*Ans.*	£11	19	0
4 *cwt*. 2 *qrs*. 20 *lbs*.	at	7½*d*.	per *lb*.	*Ans.*	£16	7	6
5 *cwt*. 2 *qrs* 16 *lbs*.	at	8*d*.	per *lb*.	*Ans.*	£21	1	4
6 *cwt*. 1 *qr*. 20 *lbs*.	at	8¼*d*.	per *lb*.	*Ans.*	£24	15	0
7 *cwt*. 2 *qrs*. 20 *lbs*.	at	8½*d*.	per *lb*.	*Ans.*	£30	9	2
8 *cwt*. 2 *qrs*. 17 *lbs*.	at	9*d*.	per *lb*.	*Ans.*	£36	6	9
8 *cwt*. 3 *qrs*. 20 *lbs*.	at	9½*d*	per *lb*.	*Ans.*	£39	11	8
9 *cwt*. 2 *qrs*. 16 *lbs*.	at	10¼*d*.	per *lb*.	*Ans.*	£46	2	6
9 *cwt*. 2 *qrs*. 20 *lbs*.	at	10½*d*.	per *lb*.	*Ans.*	£47	8	6
10 *cwt*. 2 *qrs*. 24 *lbs*.	at	10¾*d*.	per *lb*.	*Ans.*	£53	15	0
12 *cwt*. 0 *qrs* 12 *lbs*	at	11*d*.	per *lb*.	*Ans.*	£62	3	0
16 *cwt*. 2 *qrs*. 20 *lbs*.	at	11½*d*.	per *lb*.	*Ans.*	£89	10	2

24 *cwt.* 1 *qr* 8 *lbs.* at 4½*d.* per *lb.* *Ans.* £51 1 6.
26 *cwt.* 2 *qrs.* 18 *lbs.* at 1*s.* 8*d.* per *lb.* *Ans.* £243 16 8.
Note, 1*s.* 8*d.* is one-twelfth of a £.
3 *t.* 3 *cwt.* 0 *qrs.* 5 *lbs.* at 2*s.* 6*d.* per *lb.* *Ans.* £382 12 6
11 *cwt.* 3 *qrs.* 26 *lbs.* at 84*s.* per *cwt.* *Ans.* £50 6 6
10 *cwt.* 0 *qrs.* 2 *lbs.* at 93*s.* 4*d.* 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 10¼.
290 *cwt.* 3 *qrs.* 14 *lbs.* at £4·2·6 per *cwt.*
Ans. £1139 17 2¼.
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 7¾.
15 *oz.* 8 *dwts.* 4 *grs.* at 3*s.* 4*d.* per *oz.*
Ans. £2 11 4¼.
146 *oz.* 16 *dwts.* 18 *grs.* at £3·10 per *oz.*
Ans. £517 8 7½.
60 *oz.* 7 *dwts.* at 8*s.* 6*d.* per *oz.* *Ans.* £25 12 11½.
Interest of £20 for 5 months at 5 per cent.
Ans. 8*s.* 4*d.*
Interest of £22 for 7 months at 5 per cent.
Ans. 12*s.* 10*d.*
Interest of £27 for 8 months at 5 per cent.
Ans. 18*s.*
Interest of £33 for 11 months at 5 per cent.
Ans. £1 10 3.
Interest of £36·10*s.* for 6 months at 5 per cent.
Ans. 18*s.* 3*d.*
Interest of £39·15*s.* for 4 months at 5 per cent.
Ans. 13*s.* 3*d.*
Interest of £17·5*s.* for 6 months at 5 per cent.
Ans. £1 3 7½.
Interest of £55·10*s.* for 10 months at 5 per cent.
Ans. £2 6 3.
Interest of £99·15*s.* for 3 months at 5 per cent.
Ans. £3 6 6.
Interest of £126 2*s.* 6*d.* for 8 months at 5 per cent.
Ans. £4 4 1.
Interest of £133 15*s.* for 11 months at 5 per cent.
Ans. £6 2 7¼.
Interest of £999 15*s.* for 8 months at 5 per cent.
Ans. £33 6 6.

Interest of £21 for 6 months at 6 per cent.
Ans. 12*s.* 7½*d.*

Interest of £31 for 7 months at 6 per cent.
Ans. £1 1 8½.

Interest of £46 10*s.* for 6 months at 6 per cent.
Ans. £1 7 10½.

Interest of £66 15*s.* for 4 months at 6 per cent.
Ans. £1 6 8½.

Interest of £75 15*s.* for 8 months at 6 per cent.
Ans. £3 0 7½.

Interest of £95 10*s.* 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 10*s.* for 10 months at 6 per cent.
Ans. £8 15 6.

Interest of £240 10*s.* for 11 months at 6 per cent.
Ans. £13 4 6½.

Interest of £45 for 6 months at 4 per cent.
Ans. 18*s.* 0*d.*

Interest of £60 for 8 months at 4 per cent.
Ans. £1 12 0.

Interest of £70 10*s.* 6*d.* for 9 months at 4 per cent.
Ans. £2 2 3¾.

Interest of £85 15*s.* for 4 months at 4 per cent.
Ans. £1 2 10½.

Interest of £40 for 6 months at 4½ per cent.
Ans. 18*s.* 0*d.*

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 10*s.* for 8 months at 4½ per cent.
Ans. £2 5 3½.

Interest of £85 10*s.* for 12 months at 4½ per cent.
Ans. *L* 3 16 11½.

Interest of £95 6*s.* 8*d.* for 1 year and 4 months at 4½ per cent.
Ans. *L.*5 14 4½.

Interest of £135 for 1 year and 8 months at 4½ per cent.
Ans. *L.*10 2 6.

Interest of £775 10*s.* for 1 year and 10 months at 4½ per cent.
Ans. *L.*63 19 6¾.

Interest of *L*325 for 1 month at 3 per cent
Ans. 16*s.* 3*d.*

Interest of *L*.47 10*s.* for 5 months at 3 per cent.
Ans. 11*s.* 10½*d.*

Interest of *L* 123 5*s.* for 6 months at 3 per cent.
Ans. L 1 18 5½.

Interest of *L*.207 for 7 months at 3 per cent.
Ans. L.3 12 5½.

Interest of *L* 17 10*s.* for 10 months at 3 per cent.
Ans. 8*s.* 9*d.*

Interest of *L*.1406 for 12 months at 3 per cent.
Ans. L 42 3 7½.

Interest of *L*.7 6*s.* 8*d.* for 14 months at 3 per cent.
Ans 5*s.* 1½*d.*

Interest of *L*.123 17*s.* 6*d.* for 9 months at 3 per cent.
Ans. L.2 15 9.

Interest of *L* 145 10*s.* for 11 months at 3 per cent.
Ans. L.4 0 0¼*d.*

Interest of *L*.165 5*s.* for 3 months at 3 per cent.
Ans. L.3 6 1½*d.*

Interest of *L*.175 6*s.* 8*d.* for 12 months at 3 per cent.
Ans. L.5 5 2½*d.*

Interest of *L*.49 for 4 months at 2½ per cent.
Ans. 8*s.* 2*d.*

Interest of *L*.66 15*s* for 3 months at 2½ per cent.
Ans. 8*s.* 4⅛*d.*

Interest of *L*.99 15. for 8 months at 2½ per cent.
Ans. L.1 13 3.

Interest of *L*.240 for 11 months at 2½ per cent.
Ans. L.5 10.

Interest of *L* 360 for 8 months at 2½ per cent.
Ans. L.6 0.

Interest of *L* 365 for 1 year 8 months at 2½ per cent.
Ans. L.15 4 2.

Interest of *L*.65 for 21 days at 3 per cent.
Ans. 3*s.* 9*d.*

Interest of *L* 480 10*s* for 36 days at 5 per cent.
Ans. L.2 7 4½

Interest of *L*.120 for 30 days at 3 per cent.
Ans L.1 9 7.

Interest of *L*15 for 40 days at 6 per cent *Ans.* 5*s.* 11*d.*

Interest of *L*.127 for 80 days at 3 per cent. *Ans.* 16*s* 8*d.*

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 4⅛.

Amount of 365½ yards of lace at 10½*d* per yard.
Ans. £15 19 9¾.

Amount of 241 pair of gloves at 11⅜*d.* per pair.
Ans. £11 8 5⅜.

Amount of 961 pair of gloves at 7⅞*d.* per pair.
Ans. £31 10 7⅞.

Amount of 1680 yards of lace at 7⅛*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. *L.*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 6*s.* 10½*d.* per *lb.*
Ans. *L.*41 11 10½.

Amount of 161 gallons of gin at 11*s.* 3*d.* per gallon.
Ans. *L.*90 11 3.

Amount of 240 tons of coal at 11*s.* 11¾*d.* per ton.
Ans. *L.*143 15 0.

Amount of 180 tons of coal at 16*s.* 9*d.* per ton.
Ans. *L.*150 15 0.

Amount of 27½ *cwt.* of cheese at 12*s.* per *cwt.*
Ans. *L.*16 10 0

Amount of 122 *cwt.* at 17*s.* 9*d.* per *cwt.*
Ans. *L.*108 5 6.

Amount of 142 *cwt.* 2 *qrs.* at 19*s.* 6*d.* per *cwt.*
Ans. *L.*138 18 9.

Amount of 162 *cwt.* 1 *qr.* at 7*s.* 6*d.* per *cwt.*
Ans. *L.*60 16 10½.

Amount of 242⅛ of any thing at 12*s.* 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 5*s*. and sold them for 5*s*. 10*d*. each, what is the gain per cent ?

10*d*. of 5*s*. is $\frac{1}{6}$)100

£16·13·4 gain per cent.

That is, if you had laid out *L* 100 in the purchase of articles at 5*s* each, and sold them at 5*s*. 10*d*. each, you would on the expenditure of *L* 100 have gained *L*.16·13·4 or $16\frac{2}{3}$ per cent.

Bought tea at 5*s*. 4*d*. per *lb*. and sold it at 6*s*. what is the gain per cent. ?

The difference between 5*s*. 4*d*. cost, and 6*s*. selling price, is 8*d*.

8*d*. of 5*s*. 4*d*. is $\frac{1}{8}$. 8 divided into *L* 100 gives $12\frac{1}{2}$ per cent.

Bought cheese at 8*d*. per *lb*. and sold at 10*d*. what is the gain per cent. ?

2*d*. gain, is of cost price $\frac{1}{4}$)100

L.25 gain per cent.

Bought mustard at 10*d*. per *lb*. and sold it at $11\frac{1}{2}d$. what is the gain per cent. ?

1*d*. of 10*d* is $\frac{1}{10}$)100

10

$\frac{1}{2}d$. of 1*d*. is $\frac{1}{2}$ 5

L.15 gain per cent.

Bought at 2*s* 6*d*. and sold at 3*s*. $0\frac{1}{2}d$. what is the gain per cent. ?

6*d*. of 2*s* 6*d*. is $\frac{1}{5}$)100

20

$\frac{1}{2}d$. of 6 is $\frac{1}{12}$ 1·13·4

L 21·13·4 gain per cent.

Bought at 1*s*. and sold at 1*s*. $0\frac{1}{2}d$. what is the gain per cent ?

$\frac{1}{2}d$. of 1*s*. is $\frac{1}{21}$)100

L.4 · 3 · 4 gain per cent.

EXAMPLES. *Calculating on the selling price.*

Bought gunpowder at 2*s*. 6*d*. per *lb*. and sold it at 3*s*. what is the gain per cent.?

3*s*. gain 6*d*. which is $\frac{1}{6}$ part 6)100

L.16 · 13 · 4 gain per cent.

Bought mahogany at 19*d* the foot, and sold it at 20*d*. what is the gain per cent.?

20*d*. gained, 1*d*. $\frac{1}{20}$)100

L.5 gain per cent.

Bought at 8*d* 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

$5\frac{5}{19}$

3

L.15 $\frac{15}{19}$ gain per cent. or *L*.15 · 15 · 9 $\frac{9}{19}$. being about 15$\frac{3}{4}$ 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.

100

9

70)900(12 $\frac{6}{7}$, nearly 13 per cent.

200

10 { 60 / 70 } $\frac{6}{7}$

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.

100

9

61)900(14 · 18 · 4 $\frac{56}{61}$ nearly 15 per cent.

290

56 / 61 } 18 · 4 $\frac{56}{61}$

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.

$14|95 = L.14 \cdot 19$. *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|32 by 100. *Ans.* *L*.19 · 16 · $4\frac{3}{4}$.

Thus, the 19 cut off are pounds; 5 into 32 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 · 13 by 100. *Ans* *L*.34 · 10 · $9\frac{1}{2}$.

Thus, the 3 left by adding 9 ($\frac{1}{2}$ the 13*s*.) 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 16*s*. 8*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.* 1*s.*

As by the Rule the unit figure is cut off, and those not cut off are shillings.

Divide £142 by 200.

14|2 *Ans.* 14*s.* $2\frac{2}{5}d.$

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 12*s.* 6*d.* $\frac{3}{4}d.$ are allowed. see Rule. *Ans.* £1·6·$0\frac{3}{4}d.$ each.

What will 1 *cwt.* of iron cost, if for 200 *cwt.* 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.

Year.	*Month.*	*Week.*	*Day.*
£ *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 8	0 1 $2\frac{1}{4}$	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 $2\frac{3}{4}$
4 0 0	0 6 8	0 1 $6\frac{1}{2}$	0 0 $2\frac{3}{4}$
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 $3\frac{1}{4}$

Year.			*Month.*			*Week.*			*Day.*		
£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£.	*s.*	*d.*
5	15	6	0	9	7½	0	2	2¼	0	0	3¾
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	4¼
6	16	6	0	11	4½	0	2	7½	0	0	4½
7	0	0	0	11	8	0	2	8¼	0	0	4½
7	5	0	0	12	1	0	2	9¾	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	4¼	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	10¼
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	6¾	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	½
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	3¼	0	1	1½
22	0	0	1	16	8	0	8	5¾	0	1	2¾
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	4¾

Year.			Month.			Week.			Day.		
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
25	4	0	2	2	0	0	9	8¾	0	1	4½
26	0	0	2	3	4	0	10	0	0	1	5
26	10	0	2	4	2	0	10	2¼	0	1	5⅛
27	0	0	2	5	0	0	10	4½	0	1	5¾
28	0	0	2	6	8	0	10	9	0	1	6¼
29	0	0	2	8	4	0	11	1¾	0	1	7
30	0	0	2	10	0	0	11	6¾	0	1	7¾

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.

Day.

£	s.	d.
0	1	4½
0	1	5
0	1	5½
0	1	5¾
0	1	6¼
0	1	7
0	1	7¾

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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 3*s*. 6*d*. 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 9*s*. 6*d*. each?

EXERCISE III.

RULE.

As many *shillings* as *twelve* articles are worth—
so many *pence* is *one* worth.

Bought 12 *newspapers for* 7*s*., *how much was that* EACH?

12 papers being worth..... 7 SHILLINGS,
1 paper will be worth..... 7 PENCE.

If I pay 8*s*. for 12 pigeons, how much will one cost?

Suppose 12 maps cost 16*s*., what was the charge for one?

For how much may I purchase a mackarel, when a dozen are worth 7*s*.?

If 12 pairs of shoes cost 48*s*., what was that per pair?

What must I pay for a bible, when 12 are sold for 50*s*.?

Bought 12 gallons of cider for a pound, how much is that per gallon?

Received 3*s*. for a dozen glass bottles, how much was that for each?

Paid £1 10*s*. for a dozen guitar strings, what was that for each?

Gave £2 14*s*. 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 12*s*, what was the price of one?

12 ducks were bought for £1 6*s*., what was the charge for one?

Paid £6 for a dozen hats, how much is that each?

If I pay 10*s*. 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 5*s*. for a foot of gilding, what is the estimation per inch?

A dozen lamps are worth £3 10*s*., what is the value of one?

If I pay £1 19*s*. 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 14*s*.

What should I be charged for a silk handkerchief, when twelve are worth £2 16*s*.?

Suppose 12 loads of gravel cost £7 4*s*., what is that per load?

Bought 12 caps for £1 7*s*, what was the charge for one?

Tell me the value of a pound of mutton, when a leg weighing 12 lb. cost 9*s*.?

Suppose 12 blinds were estimated at £4 18*s*, what was considered the value of one?

Bought 12 curtains for £3 19*s*., how much was paid for one?

Sold 12 baskets for £1 15*s*. 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 8*s*., what is the value of one?

72 equals 6 times 12,

Therefore the £2 8*s*. or 48*s*. must be divided by the 6 .....) 6)48*s*.

Take the 8*s*. as PENCE, you have the answer. 8*d*.

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 84*s*. must be divided by 12 .....) 12)84*s*.

Consider the 7*s*. to be 7 PENCE, you have the answer .....) 7*d*.

Paid £1 4*s*. for 48 pairs of scissors, how much was that per pair?

A fishmonger paid £3 6*s*. for 72 lobsters, what did that cost him each?

If 84 bodkin-cases are worth £1 15*s*., what is the value of one?

If a news-vender demands 36*s*. for the use of a daily paper six months, how much does he charge per week?

Paid 12*s.* 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 16*s.*, I desire to know the cost of each?

Bought half a gross of wine-bottles for 18*s.* what was that each?

Paid £7 10*s.* 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 10*s.*, what is the cost of each?

Sold 132 old books for £4 19*s.*, what did they average each?

Bought a dinner service of 108 pieces, for which I paid £2 5*s.*, how much was that per piece?

A violent shower of hail destroyed 96 glass frames, the estimated damage was £43 3*s.*, how much was that per frame?

At Christmas last a stage-coach brought into London 84 packages, valued at £23 2*s.*, I desire to know the average?

A stand of 72 flowers in Covent-garden market was estimated at £16 10*s.*, 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 9*s*. 7*d*., what is the cost of one?

Take the glasses as PENCE, then . . . . 85*d*. are 7*s*. 1*d* *)
£2 9*s*. 7*d*. are 49*s*. 7*d*.)

Divide the 49*s*. by the 7*s*.

Divide the 7*d*. by the 1*d*. as follows:—

7)49	1)7
7	7

Here observe the product of both divisions is 7. therefore the value of ONE lamp-glass is 7*d*.

Purchased 107 pieces of painted glass for £4 0*s*. 3*d*., what was the cost of one?

The pieces as pence . . . . . 107*d*. are 8*s*. 11*d*.)
£4 0*s*. 3*d*. are 80*s*. 3*d*.)

8*s*. 11*d*.)80*s*. 3*d*.

9*s*. 9*d*. Therefore 9*d* 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 18*s*. 6*d*. On counting them I discovered there were 42 glasses, what did each cost?

42*d*. are 3*s*. 6*d*.
£1 18*s*. 6*d*. are 38*s*. 6*d*.

3*s*. 6*d*.)38*s*. 6*d*.

11 11 Therefore 11*d*. each

I am here also obliged to reduce the product of the first division—otherwise

Dividing by 3 into 38 would produce 12*s*. and TWO over.

The division of 6 into 2*s*. 6*d*. or 30*d*. would produce 5*d*.

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 18*s*. 6*d*., what is the price of one?

42*d*. or.....3*s* 6*d*. | 38*s*. 6*d*.
11

38*s*. 6*d*.

By inspection I see the 3*s.* 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 3*s.* 6*d.* by 11, I find it produces 38*s.* 6*d.*, therefore I know that 11*d.* is the value of one article.

How much was paid for a sheet of card board, when 61 were bought for £1 0*s.* 4*d.*?

If I purchase 98 lemons for £1 4*s.* 6*d.*, what do I pay for one?

Paid £2 5*s.* 5*d.* for 69 knives, what was the cost of one?

If I pay 8*s.* 4*d.* for 50 flower-pots, how much does one cost?

Suppose 97 hand screens cost £3 12*s.* 9*d.*, how much was that each?

If £1 13*s.* 11*d.* 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 15*s.* 9*d.*?

How much must be paid for a turkey's egg, when £1. 0*s.* 10*d.* will buy 50?

I wish to know the cost of a rabbit when I pay £1. 13*s.* 11*d.* for 37?

Paid 13*s.* 6*d.* for 27 yards of box, what was that per yard?

A bill for 58 quarts of milk is 19*s.* 4*d.*, what is that per quart?

How much am I charged per ton for cartage if the carriage of 107 tons of stone cost £3. 2*s.* 5*d.*?

Suppose a man contract to lay 91 feet of railway for £3. 0*s.* 8*d.*, how much is that per foot?

What do I pay for a gooseberry-bush if 115 cost me £4 15*s.* 10*d.*?

If 83 pickled tongues cost £3 2*s.* 3*d.*, 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 17*s*. 2½*d*. will purchase 59 pounds of brass, how much is that per pound?

59*d*.=4*s*. 11*d*.) 17*s*. 2½*d*.

3 { the multiplier to be counted pence in the answer.

14 9

½ of 4*s*. 11*d*. ...2 5½

17 2½ *Ans*. 3½*d*.

In this example, I first write the number of articles, taken as pence, by the side of the given value.

On inspection, I perceive 4*s*. will divide 4 times into 17*s*.; but allowing for the division by 11*d*., I take 3 instead and multiply thereby.

After this multiplication, I see there is a difference of nearly 3*s*. between 14*s*. 9*d*. and 17*s*. $2\frac{1}{2}d$.

I may suppose the difference is about *half* 4*s* 11*d*.

I accordingly take *the half*, and on adding the product to 14*s*. 9*d* I find the exact amount.

Therefore, the price of 1 pound is $3\frac{1}{2}d$.

If I can purchase 107 pounds of rice for £2 11*s*. $3\frac{1}{4}d$. how much is that per pound?

107*d*.=8*s*. 11*d*.) 51*s*. $3\frac{1}{4}d$. or £2 11*s*. $3\frac{1}{4}d$.
5 } the multiplier to be reckoned
5*d*. in the answer.

2	4	7	
	4	$5\frac{1}{2}$	$= \frac{1}{2}$ of 8*s*. 11*d*.
	2	$2\frac{3}{4}$	$= \frac{1}{4}$
£2	11	$3\frac{1}{4}$	*Ans*. $5\frac{3}{4}d$.

Here again I see, on inspection, that 3 would divide 6 times into 51*s*.; but allowing for the division by 11, I take only 5 for the multiplier.

The product is £2 4*s*. 7*d*., and I perceive I want nearly 7*s*. to make £2 11*s* $3\frac{1}{4}d$.

I may therefore fairly calculate that the price will be $\frac{3}{4}$ more than 5 pence, and proceed accordingly.

I take *half* of the top line for *a halfpenny*—and the *half* of that product for *a farthing*.

Adding these *three products* together, I find the amounts coincide,—and consequently conclude that the price of 1 pound is $5\frac{3}{4}d$.

Both these examples might be worked by subtracting the *product* of *the pence* from the given value, and then examining the proportion existing between the *remainder* and the *divisor*.

THUS,

4*s*. 11*d*.	)	17*s*. $2\frac{1}{2}d$.		
3		14	9	The product of the pence.
14	9	2	$5\frac{1}{2}$	The remainder is $\frac{1}{2}$ of 4*s*. 11*d*.
				Ans. $3\frac{1}{2}d$.

The advantage of this method is, that by comparing 2*s*. 5½*d*. with 4*s*. 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.

8*s*.	11*d*.	)	51*s*.	3¼*d*.			
	5		41	7			
44	7		6	3¼			

Here I can see that 6*s*. 3¼*d* must be about ¾ of 8*s*. 11*d*.—as it is evidently more than ½.

To satisfy myself I take the *half* of 8*s*. 11*d*., which is..... 4*s*. 5½*d*.
And again the *half* of that amount, viz.... 2 2¾

Producing together the required sum 6 3¼

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 8*s*. 5*d*., how much was paid for ONE?

76)188*s*. 5*d*. or £9 8*s*. 5*d*.(2*s*. 5¾*d*.
152

76 as pence=6*s*. 4*d*.)	36	5	(5¾*d*
	31	8	
	4	9	

½	3	2
¼	1	7
	4	9

I can readily suppose 4*s*. 9*d*. to be about ¾ of 5*s*. 6*d*., but merely put down the work for satisfaction.

Here 188*s.* are evidently more than the *number* of articles, which is 76.

I therefore divide by 76 for the shillings—the quotient is 2*s.*

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 12*s.* 1½*d.*, how much did each cost?

54) 172*s.* 1½*d.*, or £8 12*s.* 1½*d.* (3*s.* 2¼*d.*
162

54*d.* or 4*s.* 6*d.*) 10 1½ (2¼
9 0

1 1½

¼ | 4 6
1 1½

I put this division down only for satisfaction, as I can immediately perceive 1*s.* 1½*d.* is ¼ of 4*s.* 6*d.*

Dividing by 54, the *number of articles*, I find the shillings are 3.

The remainder 10*s.* 1½*d.*, divided by 54, as *pence*, produce the *pence and farthings*.

If 47 pounds of sugar be worth £1 1*s.* 6½*d.*, what is the value of a pound?

Suppose I am charged £1 2*s.* 2½*d.* for 82 ounces of ginger, how much is that per ounce?

If 13*s.* 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 14*s.* 3*d.*, what is the cost of a pound?

If 12*s.* 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 6*s*. 2½*d*., how much am I charged per pound?

If a hosier desire to sell 71 pairs of gloves for £2 17*s*. 8¼*d*., how much must be charged per pair?

What is the worth of a pound of loaf sugar, if 49 pounds cost £2 0*s*. 10*d*.

Paid £1 1*s*. 3¾*d*. for 31 drawing-pencils, how much was that each?

If I may purchase 68 pounds of cheese for £2 12*s*. 5*d*., how much would that be per pound?

Bought a quantity of hams weighing 73 pounds, I am charged for the whole £2 7*s*. 1¾*d*., I desire to know the cost per pound?

Bought 30 pounds of fresh butter for £1 15*s*. 7½*d*., how much is that per pound?

How much is the worth of a pound of Normandy pippins, if £1 6*s*. 3*d*. be paid for 40 pounds?

Paid £1 4*s*. 0¾*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 4*s*. 0¾*d*.

If £11 17*s* 6*d*. will purchase 57 silk handkerchiefs, what is the price of one?

What must I pay for a horse supposing 55 are worth £1 17*s*. 4¾*d*.?

If 46 pounds of lard cost £1 16*s*. 5*d*., how much would that be per pound?

Suppose £3 17*s*. 4½*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 13*s*.

If a boat of salmon, containing 101 fish, be valued at £6 2*s*. 0½*d*., what is that each?

If a grocer wish to obtain £6 6*s*. 2¼*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 2*s*. 1¾*d*.?

For how much per pound should a pork-butcher sell sausages to realize £2 3*s*. 0¼*d*. by 59 pounds?

If, at an auction, I bid £6 7*s*. 10½*d*. for 93 padlocks, what would be the individual cost?

What is stone-blue per pound, if 126 pounds are bought for £15 17*s*. 7½*d*.

How much is a hammer worth, if for £3 16*s*. 4½*d*. I can buy 78?

Taking the value of a silk stock at 4*s*, I wish to know how much I have saved individually by purchasing 63 stocks for £9 15*s*. 6¾*d*.?

If a poulterer purchase 80 pigeons for £2 10*s*., how much does he gain individually by selling them at 8*d*. each?

What does a work-box cost if £12 4*s*. 3¼*d*. be paid for 31?

Bought 29 dozen of ivory counters for 16*s*. 3¾*d*, how much was that per dozen?

If a chest of hyson tea, containing 107 pounds, be sold for £37 17*s*. 11*d*., how much is that per pound?

Suppose a cabinet-maker charge £11 1*s*. 4*d*. for 64 foot-stools, how much is that each?

If a pedlar buy 113 shaving-boxes for £5 10*s*. 7½*d*. and sell them at 1*s*. per box, what is the gain on each?

How much does a bird-trap cost if £3 19*s*. 6½*d*. be paid for 46?

For how much may I buy a half-pint mug, if 54 are worth 15*s* 9*d*.?

Paid £10 16*s*. 11*d*. for 76 cigar-cases, how much was that each?

What is the cost of a peck of oats, if £4 11*s*. 0½*d*. be paid for 95 pecks?

What are slippers per pair, when 86 pairs cost £8 12*s*.?

When the value of 44 trusses of hay is £8 17*s*. 10*d*, how much is the worth of a truss?

If 39 sheets of engraved "lines" cost 13*s*. 9¾*d*, what is that per sheet?

If an iron-monger purchase 74 rakes for £6 15*s*. 8*d*. and sell them again for 2*s*. each, how much is the individual gain?

What is a publican's profit on a quart of vinegar, supposing he sells that quantity for 1*s*., when 110 quarts cost him £4 9*s*. 4½*d*.?

If £13 6*s*. 6*d*. be paid for 52 pounds of mixed tea, how much is that per pound?

What are almonds per pound, if £3 1*s*. 2½*d*. are paid for 26 pounds?

If I pay £3 3*s*. 3½*d*. for 98 pounds of soap, how much is that per pound?

If a milliner pay £7 5*s*. 10*d*. for 70 yards of silk, how much is she charged per yard?

What is beef per pound, if 113 pounds are worth £3 1*s*. 2½*d*.

THE END.

CHARLOTTETOWN: PRINTED BY JAMES D. HAZZARD.

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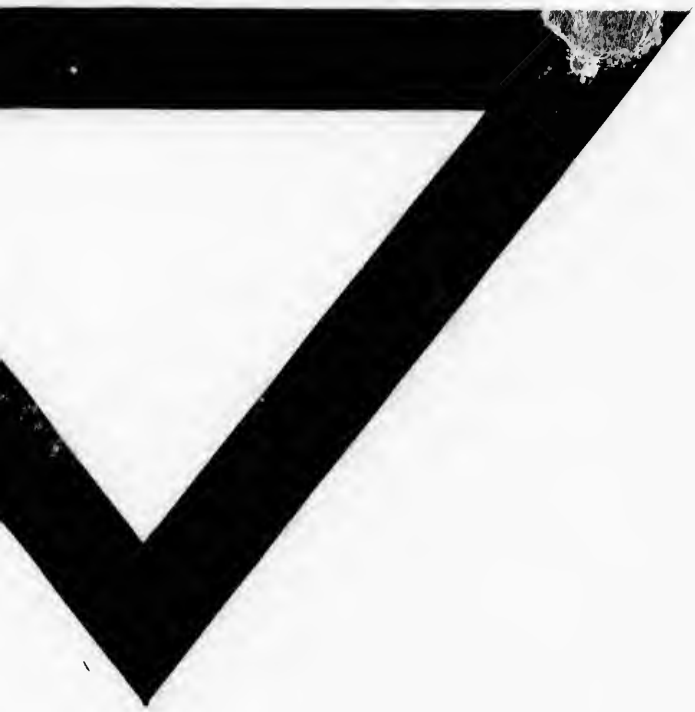
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