





Manuscript

of  
Arithmetic

BY

Edward Tilton

Horton School

# Decimals

Find the value of 32.5 of 5s.

$$32.5 \text{ of } 5 =$$

$$\begin{array}{r} 162.5 \\ 12 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 20 \overline{) 162} \\ \underline{80} \\ 82 \\ \underline{80} \\ 20 \end{array} \text{ Ans.}$$



Find the value of 44,045 of  $11\frac{1}{4}^d$   
 44,045 of  $11\frac{1}{4}^d = 44,045$  of 45 farthings =

$$\begin{array}{r} 44,045 \\ \underline{45} \\ 220225 \\ 176180 \\ \hline 1982025 \end{array}$$

$$\begin{array}{r} 4 \times 1982,025 \\ 12 \times 495,50625 \\ 20 \times 41 \text{ " } 3,50625 \\ \hline \text{£ } 2 \text{ " } 7 \text{ " } 3,50625 \text{ Ans.} \end{array}$$

Find the value of 397916 of 1 £?  
 .397916 of 1 £ =

$$\begin{array}{r} .397916 \\ \hline 7.958320 \\ \hline 11.499840 \\ \hline 1,999.360 \end{array}$$

$$\begin{array}{l} \text{£} \cdot \text{S} \cdot \text{D} \\ 0 \cdot 7 \cdot 11 \text{ Ans.} \end{array}$$

Find the value of 3.275 of 10 £?

$$\begin{array}{r} 3.275 \\ \hline 10 \\ \hline 32.750 \\ \hline 20 \\ \hline 15.000 \end{array}$$

Ans: £ 32. 15s.



Reduce 1 £. 2 s. 6 d. to the decimal of 1 £.

$$\frac{\text{£. s. d.}}{\text{£. 1.}} = \frac{240 \text{ d.}}{240 \text{ d.}} = 1.125 \text{ Ans.}^r$$

$$\begin{array}{r} 240 \overline{) 270} \quad 1.125 \text{ Ans.}^r \\ \underline{240} \\ 300 \\ \underline{240} \\ 600 \\ \underline{480} \\ 1200 \\ \underline{1200} \\ \dots \end{array}$$

Reduce 1 cwt. 3<sup>qr</sup> 7<sup>lbs</sup> to the dec. of 2 $\frac{1}{2}$  tons.

$$\begin{array}{r} \text{cwt. qr. lbs} \\ 1 \cdot 3 \cdot 7 = 203 \text{ lbs} = 5600 \\ \text{ton } 2 \frac{1}{2} = 5600 \text{ lbs} \\ \hline 20300 \\ 35000 \\ \hline 33600 \\ 14000 \\ \hline 17200 \\ 28000 \\ \hline 28000 \\ \hline \hline \end{array}$$

Reduce  $\frac{2}{33}$  to a decimal, and .3405

to a vulgar fraction?

$$\frac{2}{33} = \frac{33 \overline{) 200} \text{ (of Ans.)}}{198} = \frac{2}{33}$$

$$.3405 = \frac{3405 - 3}{9990} = \frac{3402}{9990} = \frac{1701}{4995}$$

$$\frac{189}{555} = \frac{63}{185} \text{ Ans.}$$



Simple *Proportion*

If a servants wages be £ 25, a year, what should he receive for 87 days service.

$$\begin{array}{l} \text{days} \quad \text{days} \quad \text{£} \\ 365 : 87 :: 25 : \text{Ans} \end{array}$$

$$\begin{array}{r} 435 \\ 174 \\ \hline 365 \overline{) 2175} \quad \begin{array}{l} \text{£} \\ 5 \text{..} 19 \text{..} 2 \frac{10}{13} \end{array} \text{Ans} \\ 1825 \\ \hline .350 \\ \hline 20 \end{array}$$

$$\begin{array}{r} 365 \overline{) 7000} \quad 19 \\ \underline{365} \\ 3350 \\ \underline{3285} \\ 65 \end{array}$$

$$\begin{array}{r} 365 \overline{) 780} \quad 2 \\ \underline{730} \\ 50 \quad 10 \\ \hline 365 \quad 73 \end{array}$$

If I borrowed of a friend 300 £ for 8 months, for how long a time should I lend him 200 £ in return?

$$\text{As } £200 : £300 :: 8 \text{ months} : \text{Ans}$$

$$\begin{array}{r} 200 \overline{) 2400} \quad 12 \text{ months} \text{ Ans} \\ \underline{200} \\ 400 \\ \underline{400} \\ \hline \end{array}$$



How much land at 27s per acre should be given in exchange for 480<sup>0</sup> at 35 per acre.

$$\begin{array}{r} s \\ 27 : 35 :: 480 : \text{Ans}^r \\ \hline 480 \\ 2800 \end{array}$$

$$\begin{array}{r} 140 \\ \hline 27 \overline{) 16800} \quad \underline{6229} \text{ Ans}^r \\ 162 \\ \hline 60 \\ 54 \\ \hline 60 \\ 54 \\ \hline 6 - 2 \\ \hline 279 \end{array}$$

How many gallons of wine, at the rate of 31-16<sup>s</sup> and 4d. for 46 gals., may be bought for 117-11-8<sup>s</sup>.

$$\begin{array}{r} \text{As } \overset{s}{31} \overset{d}{16} \overset{d}{4} : 117 \overset{s}{11} \overset{d}{8} :: 46 \text{ gals.} \text{ Ans}^r \\ \quad \underline{20} \quad \quad \quad \underline{20} \\ 636 \quad \quad \quad 2351 \\ \quad \underline{12} \quad \quad \quad \underline{12} \\ \text{do: } \underline{7636} \quad \quad \quad 28220 \\ \quad \quad \quad \underline{46} \\ \quad \quad \quad 160320 \\ \quad \quad \quad \underline{112880} \\ 7636 \quad \underline{1298120} \quad \text{gals.} \\ \quad \quad \underline{7636} \quad \underline{170} \text{ Ans}^r \\ \quad \quad 53452 \\ \quad \quad \underline{53452} \\ \quad \quad \dots \end{array}$$



What is the value of  $\frac{3}{7}$  of  $\frac{3}{4}$  of a ship when  $\frac{5}{8}$  of the whole is worth 525 £.

$$\frac{3}{7} \text{ of } \frac{3}{4} = \frac{3}{7} \times \frac{3}{4} = \frac{9}{28}$$

$$\frac{5}{8} : 28 :: 525$$

$$\frac{9}{28} \times 525 = 4\frac{7}{28} \times \frac{5}{8} = 4\frac{7}{28} \times \frac{5}{8} =$$

$$\frac{3\frac{7}{40} \times 800}{40} = \underline{\underline{270 \text{ £. Ans.}}}$$

A coach goes from London to Liverpool, at the rate of 9 miles an hour in 24 hours; in what time would the distance be performed on the railroad, at the rate of 32 miles an hour?

$$32 : 9 :: 24 : \text{Ans.}^2$$

$$32 \overline{) 216} \left( \frac{3}{4} \text{ Ans.}^2 \right)$$

$$\begin{array}{r} 216 \\ \underline{192} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

If 7 horses be kept 20 days for 14 £, how many may be kept 7 days for 28 £.?

$$\begin{array}{l} \text{£.} \quad \text{£} \\ 14 : 28 :: 7 \\ \text{As } 7 : 20 :: ? \end{array}$$

$$\frac{20 \times 7 \times 28}{14 \times 7} = \underline{\underline{40 \text{ horses. Ans.}^2}}$$



If a family of 9 people spend 120 in 8 months, how much will serve a family of 24 persons 16 months

months. mths.

$$\text{As } 8 : 16 :: £ 120$$

$$9 : 24$$

$$\frac{2 \quad 8 \quad 40}{\cancel{12} \times 24 \times \cancel{12} 0} = \underline{\underline{£ 640. \text{ Ans.}}}$$

$$\frac{8 \times 9}{1 \quad 3 \quad 1}$$

If a man travels 90 miles in 3 days by walking 8 hrs a day, in what will he travel 540 miles by walking 6 hrs a day.

$$\text{As } 90 : 540 :: 3 \text{ days}$$

$$8 \text{ hrs} : 6 \text{ hrs}$$

$$\frac{\cancel{90} \times 8 \times 3}{\cancel{90} \times \cancel{6}} = \underline{\underline{24 \text{ days. Ans.}}}$$



Simple Interest

Find the Simple Interest on £500 for 5 years at 5 per cent?

$$\begin{array}{r} \text{£} \\ 500 \\ \times 5 \\ \hline 2500 \\ \times 5 \\ \hline \text{Ans: } \underline{\underline{\text{£} 12500}} \end{array}$$
 £125 Ans.

Find the amt: on £7500 from May 5<sup>th</sup> to Oct: 26<sup>th</sup> at 3½ per cent?

From May 5<sup>th</sup> to Oct 26<sup>th</sup> = 175 days

$$\begin{array}{r} \frac{1}{8} \text{ } 7500 \\ \quad 3\frac{1}{2} \\ \hline 22500 \\ \quad 9375 \\ \hline 1.00 \text{ } 23437 \text{ } 10 \\ \text{£ } \underline{\underline{23437 \text{ } 10}} \end{array}$$

$$\text{Ans } 365 : 175 :: 234\frac{3}{8}$$

$$\begin{array}{r} 234\frac{3}{8} \\ \times 175 \\ \hline 1171875 \\ \quad 163875 \\ \quad \quad 468375 \\ \hline 41045 \text{ } 12 \text{ } 6 \\ \underline{365} \\ 451 \\ \underline{365} \end{array}$$
  
 Ans:  $\underline{\underline{7612 \text{ } 7 \text{ } 573}}$



865  
 730  
 135

20  
 365) 2712 (7  
 2555  
 157

12  
 365) 1890 (5  
 1825

65 = 13  
 365 = 73

Find the Int: on £2755. s 15. for  
 3 yrs. 110 days. at L. 3. s 12. d 6. percent.

L. S. d  
 8) 2755. 15. 0  
 8267. 5. 0  
 344. 9. 4 1/2

L. S. d  
 100) 8611. 14. 4 1/2  
 L 86. s 12. d 4 1/2 Int: for 1 yr.

days days L. S. D.  
 to 365: 1205: 86. 2. 4 1/2  
 20  
 1722  
 112  
 20668 1/2

1205 x 20668 1/2 =  
 365

241  
 1265 x 165345  
 8 =  
 372  
 13

Ans. £284. s 6. d 1 1/2 Int: for 3 yrs. 110



Find the amount of £95..16s..8d. for  
2 yrs. at 2½ percent. at comp. int. ?

L. s. d.  
95 " 16 " 8

---

2½

191 " 13 " 4

---

47 " 18 " 4

---

L 2.39 " 11 " 8

---

20

s 7.91

---

12

d 11.00

  

L. s. d.  
95 " 16 " 8

---

2 " 7 " 11

---

98 " 4 " 7

L. s. d.  
98 " 4 " 7

---

2½

196 " 9 " 2

---

49 " 2 " 3½

---

L 2.43 " 11 " 5½

---

20

s 9.11  
12  
13½  
2  
27½ = 3  
200 = 8

L. s. d.  
98 " 4 " 7

---

2 " 9 " 13½

---

Ans: £100 " 13s. 8½

Find the amount of £50 for 3 yrs.  
at 5 percent at comp. Int. ?

L 50

---

5

2.50

---

20

10.00

---

L. s. d.  
50 " 0 " 0

---

2 " 10 " 0

---

52 " 10 " 0

L s d  
52 " 10 " 0

---

5



L s d  
262 10 0

20  
1250

12

600

L s d  
52 10 0

2 12 0

55 2 0

L s d  
55 2 0

20  
275 12 0

13 12

12

150 1

100 2

L s d  
55 2 0

2 15 14

Ans: 57 17 7 1/2 Amt:

Find the comp. Int. on 300 L for

3 yrs at 2 2/3 per cent ?

L  
300

2 2/3

600

200

300

L 300

308 0 0

2 2/3

616 0 0

205 6 8

821 6 8

20

426

12

326 1/2

100 5

L s d  
308 0 0

8 4 3 1/2

316 4 3 1/2

2 2/3

632 8 6 2/3

210 16 2 2/3

842 4 8 2/3

864

12

776 8 = 1148 x 100 = 287

15 100 375

100

L s d  
316 4 3 1/2

8 8 7 2/3

324 12 10 3/4

300 0 0 3/4

24 12 10 3/4

312

Answer



At what rate will the int. on £100. 10s  
amount to £12. 5s. 8 1/4 in 1 1/4 yrs?

£ 102. 10s  
 $\frac{25}{24}$   
 215. 0  
 $\frac{25}{12}$  12. 6  
 230. 12. 6  
 20  
 6. 12  
 12  
 130. 6  
 $\frac{100}{6}$

As £  $\frac{147}{480}$  : £  $\frac{219}{320}$  :: 1 £

$19 \frac{219}{320} \div 2 \frac{147}{480} =$

$\frac{4059}{320} \div \frac{1107}{480} = \frac{4059}{320} \times \frac{480}{1107} = 5 \frac{9}{16}$  Ans

What sum will amount to £45. 0s. 9 3/4  
in one year, at 6 1/2 per cent?

£100 amounts to £106 1/2 in 1 year

As £106 1/2 : 45. 0. 9 3/4 :: 100

$\frac{2130}{19}$  4504. 1. 3

25560 90081

25560 108097 3 42. 5. 10 Ans

102240  
 38575  
 31120  
 7455



25560 149100 ( 5s  
 157800  
 24300

25560 255600 ( d  
 255600 10  
 . . . . 0

At what rate percent will the  
 int: on 200 L. for 14 days amount  
 to L 4" 16s?

As 365 : 14 :: 100 : L

365 ) 1400 ( L  
 365 ) 920 ( 2s  
 2420 ( 8s  
 2920  
 . . . . 0

L L  
 As 100 : 8 :: 200 : Answer  
 200

100 ) 1600 ( 16s  
 100  
 600  
 600  
 . . . . 0

L L  
 As 16 : 1 :: 4 2/3 : Answer

L  
 $\frac{1 \times 4 \frac{2}{3}}{3} = 4 \frac{2}{3} \div \frac{2}{3} =$

$\frac{21}{5} \times \frac{5}{4} = \frac{120}{20} = 6L$

Ans L 6 per cent



In what time will £44 amount  
to £486. 4s. 3d, at 4 3/4 per cent?

$$\begin{array}{r} \text{£ s. d.} \\ 419. 0. 0 \\ 18, 33. 2. 4 \frac{3}{4} \\ \hline 20 \\ 6. 62 \\ 19 \\ \hline 7, 50 = \frac{1}{2} \\ 100 = \frac{1}{2} \end{array}$$

$$\begin{array}{r} \text{£ s. d.} \\ 486. 4. 3 \frac{1}{2} \\ 419. 0. 6 \frac{1}{2} \\ \hline 67. 4. 3 \frac{1}{2} \end{array}$$

$$\begin{array}{r} \text{£ s. d.} \\ 18. 6. 17 \frac{1}{2} \\ 376 \\ 19 \\ \hline 4399 \\ 8799 \end{array}$$

$$\begin{array}{r} \text{£ s. d.} \\ 20. 4. 3 \frac{1}{2} \\ 1344 \\ 19 \\ \hline 16137 \\ 32263 \end{array}$$

8799) 32263 ( 3 2/3 Answer  

$$\begin{array}{r} 26397 \\ \hline 5866 = \frac{2}{3} \\ \hline 8799 \end{array}$$

# Discount

Find the true discount upon the fol-  
lowing bill

£ s. d. Drawn Discounted  
 419. 12. 1 March 6<sup>th</sup> at 7<sup>th</sup> mo: Sept: 15<sup>th</sup> at 5 per cent

$$\begin{array}{r} 24 \\ 376 \frac{1}{3} \\ \hline 7 \frac{2}{3} \end{array}$$

$$\begin{array}{l} \text{£} \quad \text{£} \quad \text{£} \\ \text{As } 100 \frac{2}{3} : 419 \frac{2}{3} :: 100 : \end{array}$$



$$419\frac{29}{48} \times 100 = \frac{2014100}{48} \div 7\frac{32}{73} =$$

$$\begin{array}{r} 503525 \\ 2014100 \times 73 = 31757325 = \\ \hline 48 \quad 7324 \quad 87888 \\ 12 \end{array}$$

L 418. 4. 7d

L s. d  
 419. 12. 1  
 Ans: 418. 4. 7  
1. 1. 6

Find the true discount upon the following bill.

L s. d. Given Discounted  
 587. 8. 11 Feb. 2<sup>d</sup> at 3mo: April 30. at 3<sup>3</sup>/<sub>4</sub> per cent

$$3\frac{2}{73} \times \frac{15}{4} = \frac{21}{73}$$

$$\text{Ans } 100\frac{24}{73} : 587\frac{107}{240} : 100$$

$$587\frac{107}{240} \times 100 = \frac{140987}{240} \times 100 =$$

$$\begin{array}{r} 14098700 : 100\frac{24}{73} = \frac{704935}{240} \times \frac{73}{7324} = \\ \hline 240 \quad 12 \end{array}$$

$$\begin{array}{r} 51460255 = \text{L s. d} \\ \hline 87888 = \underline{585. 10. 5} \end{array}$$

L s. d  
 587. 8. 11  
 585. 10. 5  
 Ans: 1. 18. 6



Find the true discount on the following bill

£ s. d. Drawn Discounted  
 755. 5. 9 March 17. at 3 mo. May 31. at 6 percent

$$\frac{755 \frac{5}{12}}{73} \times \frac{6}{1} = \frac{24}{73}$$

As £ 100  $\frac{24}{73}$  : £ 755  $\frac{23}{80}$  :: 100

$$755 \frac{23}{80} \times 100 = \frac{60423}{80} \times 100 = \frac{6042300}{80}$$

$$\frac{6042300}{80} : 100 \frac{24}{73} = \frac{6042300 \times 73}{7324} =$$

$$\frac{302115}{80} \times \frac{73}{7324} = \frac{22154395}{24296} = \underline{752. 16. 3}$$

£ s. d.  
 755. 5. 9  
 752. 16. 3  
 Ans: 2. 9. 6

Find the true discount upon the following bill.

£ s. d. Drawn Discounted  
 923. 2. 7 Aug. 5. at 5 mo. Dec. 3. at 3 1/2 percent

$$\frac{923 \frac{2}{12}}{73} \times \frac{10}{3} = \frac{24}{73}$$

As £ 100  $\frac{24}{73}$  : £ 923  $\frac{31}{240}$  :: 100

$$923 \frac{31}{240} \times 100 = \frac{221551}{240} \times 100 =$$

$$\frac{22155100}{240} : 100 \frac{24}{73} =$$



$$\begin{array}{r}
 1107755 \\
 22155100 \\
 \hline
 240 \\
 72
 \end{array}
 \times 73 = 80866115$$

L s. d.  
920. 2. 1  
87888

L s. d.  
923. 2. 7  
920. 2. 1  
Ans: L 3. 0. 6

Find the true discount upon the following bill,

L. s. d. Drawn Discounted  
1670. 15. 4 May 3, at 4% mo: Sept: 3, at 4 percent

$$\begin{array}{r}
 6 \\
 303 \\
 \hline
 365 \\
 73
 \end{array}
 \times \frac{4}{100} = \frac{24}{73}$$

Ans  $\frac{10024}{73} : 1670 \frac{63}{80} :: 100$

$$\begin{array}{r}
 1670 \frac{63}{80} \\
 \hline
 167080 \times 100 = 133663 \times 100 =
 \end{array}$$

$$\begin{array}{r}
 13366300 \\
 80
 \end{array}
 \div 100 \frac{24}{73} = 13366300 \times \frac{73}{100} =$$

668315.  
80  
4

$$\begin{array}{r}
 48786995 \\
 24946
 \end{array}
 = 1665. 6. 3$$

L s. d.

L s. d.  
1670. 15. 4  
1665. 6. 3  
Ans: L 5. 9. 1

Find the true discount upon the following bill.

L. s. d. Drawn Discounted  
1846. 5. 2 Dec: 25, at 2% mo: Feb: 8, at 6 percent



$$\frac{20 \times 6 = 24}{365 \times 1 = 73}$$

Ans £ 100  $\frac{24}{73}$  : 1846  $\frac{31}{120}$  :: 100

$$1846 \frac{31}{120} \times 100 = \frac{221551}{120} \times 100 =$$

$$\frac{22155100}{120} = 100 \frac{24}{73} =$$

$$\frac{1107755}{22155100} \times \frac{73}{120} = \frac{80866115}{43944} = 1846 \frac{4}{12}$$

Ans: £ 1846 5 2  
 £ 1849 4 2  
6 1 0

Find the discount on £210. 12s. 6d, due at the end of 3 1/2 yrs., at 4 1/2 per cent?

$$3 \frac{1}{2} \times 4 \frac{1}{4} = \frac{7}{2} \times \frac{17}{4} = \frac{119}{8} = 14 \frac{7}{8}$$

Ans £ 114  $\frac{7}{8}$  : 210  $\frac{24}{48}$  :: 100

$$\frac{10109}{48} \times 100 = \frac{1010900}{48} = 114 \frac{7}{8} =$$

$$\frac{505450}{1010900} \times \frac{119}{48} = \frac{505450}{18368} = 27 \frac{5}{8}$$

Ans: £ 27 5 5

# Insurance

For what sum should a cargo worth £5263. 4s. be insured, at 7 1/3 per cent, so that the owner may



recover in case of loss the value both of cargo and premium?

$$\begin{array}{r} \text{£} \\ 100 \\ \overline{73} \\ 27 \end{array}$$

$$\text{As } \text{£} 92\frac{3}{4} : \text{£} 5263 :: \text{£} 100$$

$$\frac{5263 \times 100}{92\frac{3}{4}} = \frac{526300}{92\frac{3}{4}}$$

$$\frac{526300 \times 3}{1} = 1578900 \text{ £ s. d.}$$

$$\begin{array}{r} 277 \\ 277 \\ \hline 5700 \quad 0 \quad 0 \end{array}$$

Ans: £ 5700. 0. 0

# Stocks

What sum must be invested in the 3 per cents. at  $94\frac{1}{4}$  to yield an annual income of £ 500?

$$\text{As } 3 : 94\frac{1}{4} :: 500$$

$$94\frac{1}{4} \times 500 = \frac{377}{4} \times 500 =$$

$$\frac{188500}{4} \div 3 = \frac{188500}{4} \times \frac{1}{3} = \frac{47125}{3} =$$

Ans £ 15708. 6. 8 £. D.



A sum is laid out in the 3 per cents at  $89\frac{3}{8}$  and a half years dividend received upon it; the stock being sold at  $94\frac{3}{8}$ , and the whole increase of capital being £54, find the original sum laid out.

$$\begin{array}{r} 94\frac{3}{8} \\ 89\frac{3}{8} \\ \hline 5\frac{7}{8} \\ 1\frac{3}{4} \\ \hline 6\frac{3}{4} \end{array}$$

$$\text{As } 6\frac{3}{4} : 89\frac{3}{8} :: 54$$

$$89\frac{3}{8} \times 54 = \frac{715}{8} \times 54 = \frac{38610}{8} \div 6\frac{3}{4} =$$

$$\begin{array}{r} 1430 \\ 38610 \times \frac{4}{8} = \frac{1430}{2} = 715 \text{ Ans} \\ \hline 8 \quad 27 \quad 2 \end{array}$$

## Profit and Loss

A merchant, by selling sugar at £4-14s-6 per cwt., loses 18 per cent; what was his prime cost?

$$\begin{array}{r} 100 \\ 18 \\ \hline 82 \end{array}$$

$$\text{As } 82 : 4\frac{29}{40} :: 100 :$$

$$4\frac{29}{40} \times 100 = \frac{189 \times 100}{40} = \frac{18900}{40} = 472\frac{1}{2}$$