

$$18900 : 82 = \frac{18900 \times 100}{82} = 23048.78$$

$$\frac{23048.78}{40} = 576.22$$

Ans L. 5. 15. 9³⁸ prime cost.

On the sale of 112 yards of silk velvet at L 2. 8s per yard, a merchant loses L 11. 4s; what was the prime cost of the whole, and the loss per cent?

$$\begin{array}{r} \text{L. } 2 \text{ } 8 \text{ } 0 \\ \text{L. } 2 \text{ } 8 \text{ } 0 \\ \hline 268 \text{ } 16 \text{ } 0 \\ 11 \text{ } 4 \text{ } 0 \\ \hline 280 \text{ } 0 \text{ } 0 \text{ prime cost.} \end{array}$$

$$\text{Ans } 280 : 113 :: 100$$

$$113 \times 100 = \frac{56}{5} \times 100 = 1120$$

$$\frac{5600}{5} : \frac{280}{1} = \frac{5600 \times 1}{5 \times 280} = 4 \text{ per cent}$$

Ans 280; 4 per cent.

A person buys 50 reams of paper which he thought to sell at L 1. 2s. 6d per ream making 8 per cent. profit on the prime cost; but, 5 reams being damaged, what did

the gain or lose per cent. by selling the remainder at the same rate?

As £ 108 : £ 100 :: £ 118

$$\frac{9}{8} \times 100 = \frac{900}{8} \times \frac{1}{108} = \frac{225}{216}$$

£. s. d

1. 0. 10 prime cost.

£. s. d

1. 0. 10

52. 1. 8

£. s. d

1. 2. 6

50. 12. 6

As £ 52 1/2 : £ 50 5/8 :: £ 100

$$\frac{495}{8} \times 100 = \frac{40500}{8} = \frac{625}{12}$$

$$\begin{array}{r} 162 \\ 324 \\ \hline 1620 \\ 8 \\ \hline 2 \end{array}$$

$$\frac{3}{12} = \frac{486}{3} = 97 \frac{1}{2}$$

£ 100

Ans: 97 1/2

If eggs be bought at the rate of 5 a penny, how many should be sold for 7d., to gain 40 per cent.?

$$\frac{5}{35}$$

As 140 : 100 :: 35

$$\frac{5}{100} \times 35 = 25 \text{ Ans: } \frac{142}{12}$$

If a person purchase pins, when they are 18 in a row, and sell them, 11 in a row, at the same price, how much is his gain percent. on his outlay?

$$\frac{18}{11}$$

$$\text{As } 11 : 100 :: 7$$

$$\frac{100 \times 7}{11} = \frac{700}{11} = 63 \frac{7}{11} \text{ Ans.}$$

If 8 oz. of gold, 10 carats fine, and 2 oz., 11 carats fine, be mixed with 6 oz. of unknown fineness, and that of the mixture be 12 carats, what was the unknown fineness?

$$\left(8 \times \frac{10}{24} \right) + \left(2 \times \frac{11}{24} \right) =$$

$$\frac{80 \times 10}{24} + \frac{22}{24} = \frac{104}{24}$$

$$16 \times \frac{12}{24} = \frac{192}{24}$$

$$\frac{192}{24} - \frac{104}{24} = \frac{88}{24}$$

$$\frac{88}{24} \div 6 = \frac{15}{24} = 15 \text{ carats. Ans.}$$

In England, gunpowder, is made of 75 parts of nitre, 10 of sulphur, and 15 of charcoal; in

France, of 77 of nitre, 9 of sulphur, and 14 of charcoal: if half a ton of each be mixed, what weight of nitre, sulphur, and charcoal, will there be, in the compound?

$$\begin{array}{r} 75 \\ 10 \\ 15 \\ \hline 100 \end{array} \qquad \begin{array}{r} 77 \\ 9 \\ 14 \\ \hline 100 \end{array}$$

$$\frac{75}{100} = \frac{3}{4} \text{ of } \frac{1 \text{ ton}}{2} = 840 \text{ nitre,}$$

$$\frac{10}{100} = \frac{1}{10} \text{ of } \frac{1 \text{ ton}}{2} = 112 \text{ sulphur,}$$

$$\frac{15}{100} = \frac{3}{20} \text{ of } \frac{1 \text{ ton}}{2} = 168 \text{ charcoal,}$$

$$\frac{77}{100} \text{ of } \frac{1 \text{ ton}}{2} = 862 \frac{2}{3} \text{ nitre,}$$

$$\frac{9}{100} \text{ of } \frac{1 \text{ ton}}{2} = 100 \frac{2}{3} \text{ sulphur,}$$

$$\frac{14}{100} \text{ of } \frac{1 \text{ ton}}{2} = 156 \frac{2}{3} \text{ charcoal.}$$

840 lbs	112 lbs.	168 lbs
<u>862 $\frac{2}{3}$</u>	<u>100 $\frac{2}{3}$</u>	<u>156 $\frac{2}{3}$</u>
<u>1702 $\frac{2}{3}$ Nitre,</u>	<u>212 $\frac{2}{3}$ Sulphur,</u>	<u>324 $\frac{2}{3}$ Charcoal.</u>

Nitre, Sulphur, Charcoal.

Ans 1702 $\frac{2}{3}$; 212 $\frac{2}{3}$; 324 $\frac{2}{3}$; lbs.

A, and B, rent a pasture for £275; A puts in 80 sheep and B 100, but at the end of 6 months they each dispose of half their stock and

allow C to put in 50 sheep to feed; what should
 A, B, C, severally pay towards the rent
 at the year's end?

80	100	120
<u>40</u>	<u>50</u>	<u>50</u>
As 20, Bs 150, Cs 50		320

$\frac{120}{320} = \frac{3}{8}$ of £ 275 = 103. 2. 6 A's share.

$\frac{150}{320} = \frac{15}{32}$ of £ 275 = 128. 18. 14 B's share

$\frac{50}{320} = \frac{5}{32}$ of £ 275 = 42. 14. 11 1/2 C's share

Miscellaneous Qs.

What is the cost of 530 lbs. of tea at 7. 6d. per lb.?

£ is 1/2 of 1s	530
	<u>7</u>
	3710
	<u>265</u>
20	3975
£	<u>198. 15s</u> Ans.

How many yards of matting 2 ft. 6 in. broad
 will cover a room which is 96 ft long and 70 ft broad

$$96 \times 70 \div 2 \frac{1}{2} = 96 \times 70 \div \frac{5}{2} =$$

$$96 \times 70 \times \frac{2}{5} = 2688 = \frac{2688}{3} = \underline{896} \text{ yds. Ans.}$$

If a printer set up 8500 letters a-day
and charge $5\frac{1}{2}$ per 1000 how much will
he earn in a week?

$$\frac{8500}{1000} = 8\frac{1}{2} \times 5\frac{1}{2} = \frac{17}{2} \times \frac{11}{2} =$$

$$\begin{array}{r} 187 \\ \frac{4}{1} \\ 2 \end{array} \begin{array}{r} 3 \\ \frac{6}{1} \\ 2 \end{array} \begin{array}{r} 561 \\ \frac{2}{1} \\ 2 \end{array} = 280\frac{1}{2}$$

Ans $1.3.4\frac{1}{2}$

What must be the length of a plot of ground,
if the breadth be $15\frac{3}{4}$ ft. that its area may
contain 46 square yards?

$$\begin{array}{l} \text{sq. yds.} \quad \text{ft} \\ 46 = 414 \end{array}$$

$$\frac{414}{1} \div 15\frac{3}{4} = \frac{414 \times 4}{1 \times 63} = \frac{1656}{63} = 26\frac{2}{7}$$

Length $26\frac{2}{7}$ ft. Ans

If A can do a piece of work in 10 days,
and A and B can do it together in 7 days,
in what time would B alone do it?

$$\frac{10}{7} = 3$$

$$As\ 3:7::10:$$

$$\frac{7 \times 10}{3} = 23\frac{1}{3}$$

$$Ans\ 23\frac{1}{3}$$

If a person lend me 1296 quires
when they are valued at L. 1s. 6d.
how many must I pay him when
they are valued at L. 1s.?

$$As\ 1\frac{1}{20} : 1\frac{3}{40} :: 1296$$

$$\frac{216}{43} \times \frac{432}{11} \times \frac{20}{21} = \frac{9200}{7}$$

$$1326\frac{6}{7} \text{ quires}$$

The estate of a bankrupt £21000, is to
be divided among four creditors, whose
debts are A's to B's as 2:3 B's to C's as
4:5 C's to D's as 6:7; what must each
receive?

$$A : B :: 2 : 3$$

$$A \times 3 = B \times 2$$

$$\therefore A = \frac{2}{3} B$$

$$B : C :: 4 : 5$$

$$B \times 5 = C \times 4$$

$$\therefore C = \frac{5}{4} B$$

$$C : D :: 6 : 7$$

$$C \times 6 = D \times 7$$

$$\therefore D = \frac{6}{7} C$$

$$\text{But } C = \frac{5}{4} B$$

$$\therefore D = \frac{7 \text{ of } 5}{6 \text{ of } 4} B = \frac{35}{24} B$$

$$B = 1 = \frac{24}{24}$$

$$A = \frac{2}{3} = \frac{16}{24}$$

$$C = \frac{5}{4} = \frac{30}{24}$$

$$D = \frac{35}{24} = \frac{35}{24}$$

$$\frac{105}{24}$$

$$\text{Ans } \frac{105}{24} : \frac{24}{24} :: 21000 \text{ L}$$

$$\frac{24}{24} \times \frac{21000}{1} \times \frac{24}{105} = 11800 \text{ B's } \text{L}$$

$$\text{Ans } \frac{105}{24} : \frac{16}{24} :: 21000 \text{ L}$$

$$\frac{16}{24} \times \frac{21000}{1} \times \frac{24}{105} = 3200 \text{ A's } \text{L}$$

$$\text{Ans } \frac{105}{24} : \frac{30}{24} :: 21000 \text{ L}$$

$$\frac{30}{24} \times \frac{21000}{1} \times \frac{24}{105} = 6000 \text{ C's } \text{L}$$

$$\text{Ans } \frac{105}{24} : \frac{35}{24} :: 21000 \text{ L}$$

$$\frac{35}{24} \times \frac{21000}{1} \times \frac{24}{105} = 7000 \text{ D's } \text{L}$$

Ans: A's 3200, B's 11800, C's 6000, D's 7000

D's 7000 L

The exterior diameter of a metal pipe is 3 in., the interior 2 in.; what is the area of the circular ring in the section?

$$\begin{array}{r}
 3 \quad 3 \quad 5 \\
 2 \quad 2 \quad 1 \\
 \hline
 5 \quad 1 \quad 5 \\
 \quad \quad \quad \cdot 7854 \\
 \hline
 3.9270
 \end{array}$$

Ans 3.927 sq. inches

Find the value of 36.42 tons of coal at s. 17. 7/4 d per ton?

$$\begin{array}{r}
 s. \quad d. \\
 17 \quad 7/4 = 845
 \end{array}$$

$$\begin{array}{r}
 36.42 \\
 \quad 845 \\
 \hline
 18210 \\
 14568 \\
 \hline
 29136
 \end{array}$$

$$\begin{array}{r}
 4 \quad 130774.90 \\
 12 \quad 1693.725 \\
 \hline
 20 \quad 6411.1725 \\
 \hline
 2 \quad 3205.58625 \text{ d Ans.}
 \end{array}$$

How many feet in 150 must a road 10798 feet long rise to be carried from a plain to a hill 463 feet in perpendicular height?

$$\text{Ans } 10798 : 463 :: 150$$

$$\begin{array}{r}
 75 \\
 150 \times 463 = 34725 = 6 \frac{2331}{5399} \text{ Ans.} \\
 \hline
 10798 \quad 5399 \\
 \hline
 5399
 \end{array}$$

Required the area of a heptagonal garden, whose side measures $1\frac{1}{4}$ ft. 6 in. and perpendicular 18 ft.

$$\begin{array}{r} 1\frac{1}{4}\text{ ft. } 6\text{ in.} \\ \hline 122\text{ " } 6 \\ 18\text{ " } 0 \\ 2) 2205\text{ " } 0 \\ \hline 1102\text{ " } 5 \text{ sq. ft.} \end{array}$$

Ans: $1102\text{ " } 5$ sq. ft.

What is the present worth of £325. 11s. 6d. due at the end of 5 months at $4\frac{1}{2}$ per cent.?

$$\frac{5}{12} \times \frac{4\frac{1}{2}}{100} = \frac{15}{8} = 1\frac{3}{8}$$

$$\text{As } 101\frac{3}{8} : 100 :: 325\frac{5}{6}$$

$$100 \times \frac{391}{1925} \times \frac{4}{5} = \frac{156400}{459} = 319\text{ " } 16\text{ " } 5\text{ " } 163$$

Ans $319\text{ " } 16\text{ " } 5\text{ " } 163$

How many square yards are there in a parade, 864 ft. 3 in. long and 62 ft. 6 in. broad?

$$\begin{array}{r} 864\text{ " } 3\text{ in.} \\ 62\text{ " } 6 \\ \hline 53583\text{ " } 6 \\ 432\text{ " } 1\text{ " } 6 \\ 9) 54015\text{ " } 6 \\ \hline 6001\text{ " } 6\text{ " } 90\text{ in.} \end{array}$$

Ans: $6001\frac{53}{2}$ sq. yds.

How much stock must be bought at 88 per cent. in order that, when the stocks are at 90.20 quineas, may be gained?

$$\begin{array}{r} 90 \\ 88 \\ \hline 2 \end{array}$$

As £ £ £
As 2: 21 :: 100

$21 \times 50 = 1050$ Ans.

If £100 be placed at interest at 5 per cent, and the interest be added to the principal every 20 years, in how many years will it amount to £1000?

$$\begin{array}{r} 100 \\ 5 \\ \hline 500 \\ 20 \\ \hline 100.00 \\ 200 \\ 5 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 1000 \\ 20 \\ \hline 200.00 \end{array}$$

$$\begin{array}{r} 400 \\ 5 \\ \hline 2000 \\ 20 \\ \hline 400.00 \end{array}$$

400
 400
800 amt: in 6 years

As 500: 200 :: 20

$$\begin{array}{r} 200 \times 20 = 5 \text{ years} \\ 800 \\ 4 \end{array}$$

$$\begin{array}{r} 60 \\ 5 \\ \hline 65 \text{ Ans} \end{array}$$

The prime cost of a 50 gallon cask of wine is £25, and 10 gallons are lost by leakage, at what price per gall. must the remainder

How be sold so as to gain 10 per cent. on the whole original cost?

as 100:110::25

$$\begin{array}{r}
 25 \\
 \hline
 530 \\
 100 \overline{) 2750} \quad \text{L. S.} \quad \begin{array}{r} 50 \\ 10 \\ \hline 40 \end{array} \\
 \hline
 2750 \quad \underline{2750}
 \end{array}$$

L. S. D. L. S. D Ans:

$$\begin{array}{r}
 40 \overline{) 2750} \quad 0 \quad 13 \quad 9 \\
 \hline
 20 \\
 40 \overline{) 550} \quad (13s \\
 \hline
 40 \\
 150 \\
 120 \\
 \hline
 30 \\
 40 \overline{) 360} \quad (9d \\
 \hline
 12 \\
 360 \\
 \hline
 360
 \end{array}$$

If the carriage of 6 cwt. for 20 miles cost £14¹/₂

what can I have carried 30 miles for £5¹/₁₆?

As $\begin{array}{r} \text{L } 1 \\ 14 \frac{1}{2} \end{array} : \begin{array}{r} \text{L } 5 \\ 5 \frac{1}{16} \end{array} :: \text{miles } 30 : 20 :: \underline{66 \text{ cwt}}$

$$\begin{array}{r}
 84 \times 60 \times 20 \times 2 \\
 \hline
 11 \times 30 \times 129 \quad \frac{435}{29} \quad \underline{15 \text{ Ans.}} \\
 \hline
 \times 2
 \end{array}$$

If 7 oxen are worth 12 sheep, and 3 sheep cost 112 what must be given for 100 oxen?

As $\begin{array}{r} \text{oxen} \\ 7 \end{array} : \begin{array}{r} \text{oxen} \\ 100 \end{array} :: \begin{array}{r} \text{sheep} \\ 42 \end{array}$

$$100 \times \frac{6}{7} = 600 \text{ sheep}$$

As $\begin{array}{r} \text{sheep} \\ 3 \end{array} : \begin{array}{r} \text{sheep} \\ 600 \end{array} :: \begin{array}{r} \text{L} \\ 10 \end{array}$

$$10 \times \frac{200}{3} = \underline{2000 \text{ L. Ans.}}$$

A person buys teas at 3s. and 4s. the lb., and

mixes them in the proportion of 4:7; what
will be gain percent. by selling at 3s. 9d. per lb.

$$\begin{array}{r} 3 \times 4 = 12 \\ 4 \times 7 = 28 \\ \hline 1140 \end{array}$$

As $3\frac{7}{11} : 3\frac{3}{4} :: 100 \text{ or } 2000 :$

$$\begin{array}{r} 25 \\ 50 \\ 15 \times 2000 \times 11 = 103.2.6 \\ \frac{4}{2} \quad 1 \quad 40 \end{array}$$

$$\begin{array}{r} \text{L. S. D.} \\ 103. 2. 6 \\ 100. 0. 0 \\ \hline 3. 2. 6 \end{array} \quad \text{3}\frac{1}{4} \text{ gain per cent. Ans.}$$

$$\begin{array}{r} 36 \\ 27 \\ \hline 63 \end{array}$$

$$\begin{array}{r} 622 \\ 622 \\ \hline 1244 \end{array}$$

$$\begin{array}{r} 7621 \\ 7621 \\ \hline 15242 \\ 801 \\ \hline 16043 \\ 217 \\ \hline 16260 \\ 36 \\ \hline 16326 \\ 36 \\ \hline 16362 \end{array}$$

$$\begin{array}{r} 1296 \\ 66396 \\ \hline 81396 \\ 36 \\ \hline 81432 \end{array}$$

Measurement

Superficial **Mensuration**

What is the area of a square table, the side of which measures 3 ft. 8 in.?

ft.	in.
3	8
3	8
11	0
2	5.4
<u>13</u>	<u>5.4</u>

Ans: 13 ft. 5 in. parts.

What is the area of a parallelogram, whose base is 6 ft. 4 in. and perpendicular breadth height 3 ft. 5 in.?

$13 \times 3 \frac{5}{12} = 39 \times \frac{41}{12} = \frac{1574}{3} = 524 \frac{2}{3}$ ft. in. parts
 Ans: 52 ft. 7 in. 8 parts

Required the acreage of a field, in the form of a parallelogram, whose length or base is 930 links and perpendicular breadth 480 links.

$$\begin{array}{r}
 930 \\
 \times 480 \\
 \hline
 31720 \\
 44000 \\
 \hline
 100000) 446400 \\
 \underline{446400} \\
 185600 \\
 \underline{185600} \\
 3424000
 \end{array}$$

Ans: A. R. P.
4 " 1 " 34

Required the acreage of a field, in the form of a parallelogram, whose length or base is 930 links and perpendicular breadth 480 links?

$$\begin{array}{r}
 930 \\
 \times 480 \\
 \hline
 31720 \\
 44000 \\
 \hline
 100000) 446400 \\
 \underline{446400} \\
 185600 \\
 \underline{185600} \\
 3424000
 \end{array}$$

Ans: A. R. P.
4 " 1 " 34

How many yards of carpet, 3 qrs. wide
will cover a room that measures $11\text{ ft } 3\text{ in.}$
by $9\text{ ft } 4\frac{1}{2}\text{ in.}$?

$$14\frac{1}{4} \times 9\frac{3}{8} = \frac{57}{4} \times \frac{75}{8} = \frac{4275}{32} =$$

$$\frac{4275}{32} \div \frac{9}{4} = \frac{4275}{32} \times \frac{4}{9} = \frac{475}{8} =$$

$$\frac{475}{8} = \frac{\text{Yds. ft. in.}}{10 \quad 2 \quad 4\frac{1}{2}} =$$

Ans: 19 2 4 $\frac{1}{2}$
Yds. ft. in.

field,

How many acres are in a rectangular
field the length of which is $13\frac{7}{8}$ links, and
breadth 95 links?

$$\begin{array}{r} \text{links} \\ 13\frac{7}{8} \\ \times 95 \\ \hline 68\frac{7}{8} \\ 123\frac{7}{8} \\ \hline 1,306\frac{25}{8} \\ \times 4 \\ \hline 1,22500 \\ \times 40 \\ \hline \underline{\underline{9,00000}} \end{array}$$

Acres, roods, perches
Ans: 1 1 9

A coach goes round the rectangular field A, B, C, D; it is required to find the area of the ground taken up by the coach road, when its breadth is 4 yards; the length A, B of the field being 88 yds., and the breadth 4 yds.?

$$\begin{array}{r} 40 \\ \underline{4} \\ 36 \\ \underline{4} \\ 144 \\ \underline{2} \end{array}$$

$$\begin{array}{r} 88 \\ \underline{4} \\ 84 \\ \underline{4} \\ 336 \\ \underline{2} \end{array}$$

288

$$\begin{array}{r} 672 \\ \underline{288} \\ 960 \text{ sq. yds.} \end{array}$$

square yds.
Ans 960.

The sides of a triangle are 9, 8, and 7; required the area?

$$\begin{array}{r} 98 \\ \underline{2) 98} \\ 12 \end{array}$$

$$\begin{array}{r} 12 \\ \underline{3} \end{array}$$

$$\begin{array}{r} 12 \\ \underline{4} \end{array}$$

$$\begin{array}{r} 12 \\ \underline{5} \end{array}$$

$$12 \times 3 \times 4 \times 5 =$$

$$\begin{array}{r} 3 \\ \underline{36} \end{array}$$

$$\begin{array}{r} 4 \\ \underline{144} \end{array}$$

$$\begin{array}{r} 5 \\ \underline{1440} \end{array}$$

2) 720 26.83. de. Ans:

46) 320
 276
 528) 4400
 4224
 5363) 17600
 16089
1511

The side of an equilateral triangle is 12ft.;
 required its area?

12 18 18 18
 12 12 12 12
 2) 36 6 6 6
18

18 x 6 x 6 x 6 =
6
 108
6
 648
6

3888 (12.353 Ans:

122) 288
 244
 1243) 4400
 3724
 12465) 67100
 62325
 124703) 477500
 3174109
103391

Required the area of a triangular field,
 whose sides are 469, 427.8, and 512.8 links

469
 427.8
 512.8
 2) 1409.6
704.8

704.8	704.8	704.8
<u>469.0</u>	<u>427.8</u>	<u>512.8</u>
235.8	277.0	<u>192.0</u>

$$704.8 \times 235.8 \times 277 \times 192 =$$

8838746818.56 94014.6 =

81

184) 738 P.

18801) 736 R 30.4 Ans.

27468

18801

188024) 866718

752096

1880286) 11462256

11281716

180540

How many square yards of paving are there in a trapezium, whose diagonal

is 20 yds., and the perpendiculars 4.2 & 3.8 yds?

4.2
3.8
8.0

$$\frac{20 \times 8}{2} = \frac{160}{2} = 80$$

Ans: 80 sq. yards.

In measuring along one side A B of the field A. B. C. D, I found A P = 110 links the perpendicular C P = 352, A D = 745, the perpendicular D Q = 595 and A B = 1110; required the area?

Area triangle A.P.C. = $110 \times 352 = 38720$

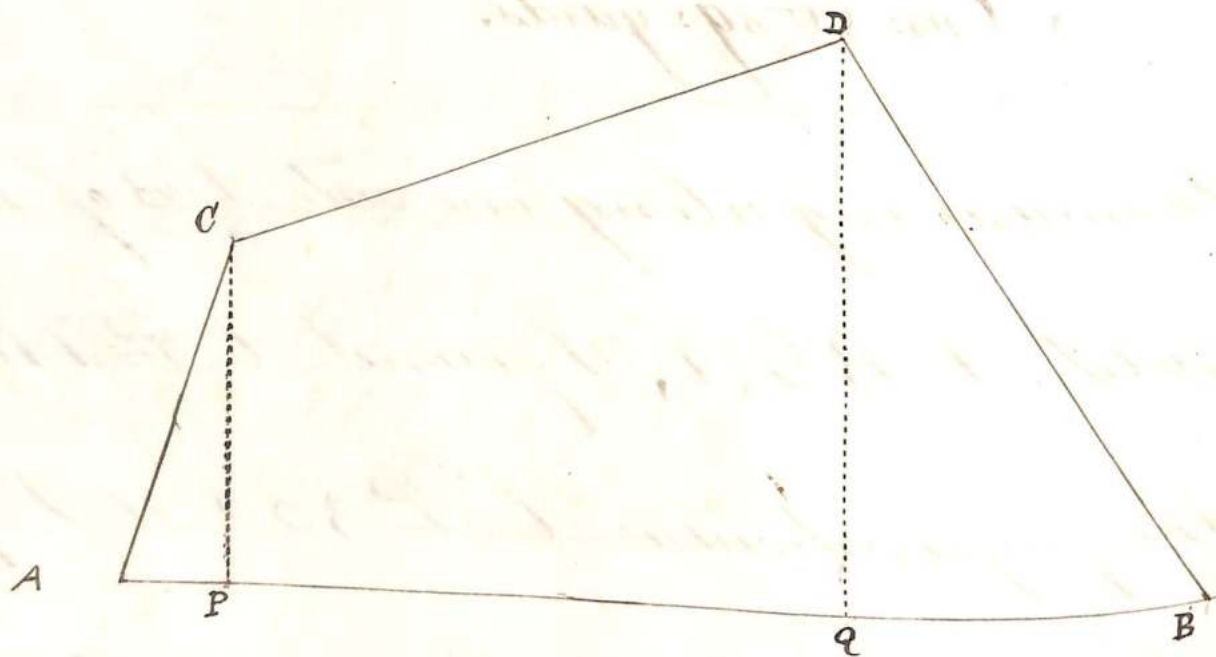
Area trapezoid P.Q.D.C. = $947 \times 635 = 601345$

Area triangle Q.B.D. = $595 \times 365 = 217175$

Area A.B.D.C. = $\frac{2 \ 857 \ 240}{4} = 428620$ sq. ft.

= 4 ac. 1 r. 5 79 p.

Ans: 4 A. 1 R. 5. 79 p.



Required the area of the area of the irregular figure A.B.C.D. the following diagonals and perpendiculars being given

viz. A.C. 27.5, B.D. 9, C.M. 6.5, G.C. 22, D.G. 11.5, F.D. 26, G.O. 6, and E.P. 4.

viz. A.C. 27.5, B.D. 9, C.M. 6.5, G.C. 22, D.G. 11.5, F.D. 26, G.O. 6, and E.P. 4.

D.G. 11.5, F.D. 26, G.O. 6, and E.P. 4.

Area A.B.C. = $27.5 \times 9 = 247.5$

Area A.C.B. = $27.5 \times 6.5 = 178.75$

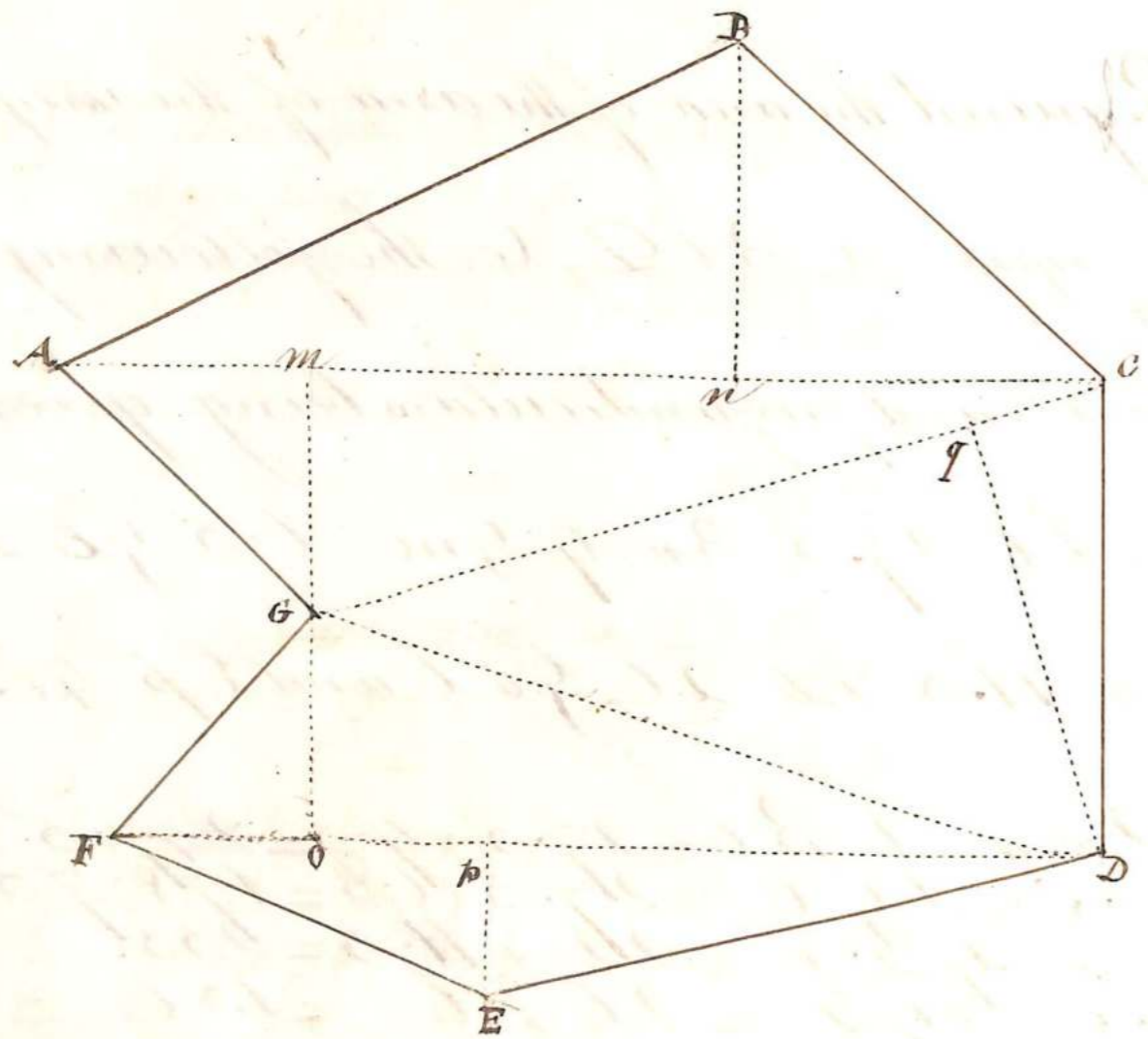
Area G.D.C. = $22 \times 11.5 = 253$

Area F.D.E. = $26 \times 6 = 156$

Area F.D.E. = $26 \times 4 = 104$

$\frac{104}{2} = 52$

Area A.B.C.D. = $\frac{247.5 + 178.75 + 253 + 156 + 104}{2} = 469.625$

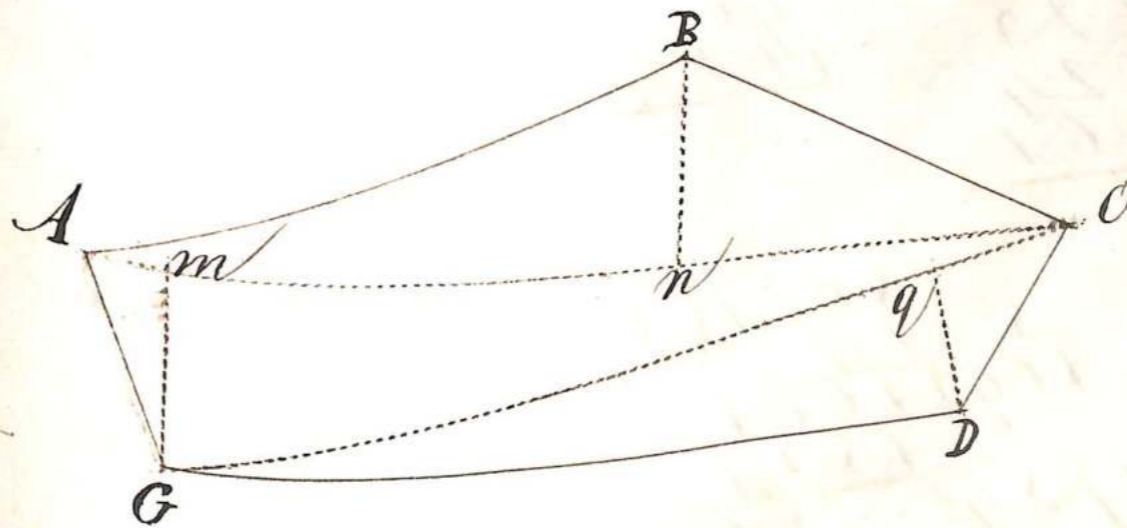


Required the area of a pentangular figure
 A. B. C. D. G. A. when the diagonal
 A. C. = 40 and the two perpendiculars

Bn. and Gm. upon it are 8 and 9; the dia-
 gonal G. C. = 38 and the perpendicular D. g.
 upon it is 6?

$$\begin{array}{r}
 2 \text{ area } A. B. G. = 40 \times 8 = 320 \\
 \text{" } G. A. C. = 40 \times 9 = 360 \\
 \text{" } G. C. D. = 38 \times 6 = 228 \\
 \hline
 908 \\
 \hline
 454
 \end{array}$$

Ans 454.



A line of 95 yds. will reach from the top of a castle, which stands at the side of a river, to the opposite bank; required the breadth of the river, the height of the castle being 32 yds.?

$$\begin{array}{r}
 95 \\
 95 \\
 \hline
 175 \\
 835 \\
 \hline
 9025 \\
 11024 \\
 \hline
 8001
 \end{array}
 \qquad
 \begin{array}{r}
 32 \\
 32 \\
 \hline
 64 \\
 96 \\
 \hline
 1024
 \end{array}$$

$$\begin{array}{r}
 8^2 \quad 8001 \quad (89.44) \\
 64 \\
 \hline
 169 \quad 1601 \\
 1521 \\
 \hline
 1784 \quad \dots \quad 8000 \\
 17884 \quad 7136 \\
 \hline
 \quad \quad 86400
 \end{array}$$

$$\begin{array}{r}
 71536 \\
 \hline
 14864
 \end{array}$$

Ans 89.44 yds.

A ladder 45 ft. long being placed in a street, will exactly reach to a window 2 ft. from the ground on one side; and upon being turned over, without moving the foot, will reach a window 3 ft. high on the other side; required the breadth of the street?

$$\begin{array}{r}
 45^2 \\
 45 \\
 \hline
 225 \\
 180 \\
 \hline
 2025
 \end{array}
 \qquad
 \begin{array}{r}
 27^2 \\
 27 \\
 \hline
 184 \\
 54 \\
 \hline
 729
 \end{array}
 \qquad
 \begin{array}{r}
 2025 \\
 729 \\
 \hline
 1296
 \end{array}$$