

1 Direct proportion

5 m of fabric costs £23.75.

- a) Find the cost of 8 m of the fabric.
- b) How many whole metres of it can you buy for £60?

a) $23.75 \div 5 = £4.75, \times 8 = £38.00$

b) $60 \div 4.75 = 12.6\dots$, so 12 m

2 Inverse proportion

A bag of feed lasts 12 hens for 15 days. The hens all eat the same amount.

- a) How long would the bag last 20 hens?
- b) For how many hens would it last 30 days?

$12 \times 15 = 180$ hen days

a) $180 \div 20 = 9$ days

b) $180 \div 30 = 6$ hens

3 Proportion equations

y is directly proportional to x .

- a) Complete the table.
- b) Write an equation for y in terms of x .

x	3	7	10	12
y	7.5	17.5	25	30

a) $7.5 \div 3 = 2.5$

b) $y = 2.5x$

4 Direct proportion: $y = kx$

y is directly proportional to x^2 . When $x = 3$, $y = 45$.

- a) Find a formula for y in terms of x .
- b) Find the positive value of x when $y = 320$.

a) $45 = k \times 9, k = 5, y = 5x^2$

b) $x^2 = 320 \div 5 = 64, x = 8$

5 Proportion: worded problems

The distance, d m, that a stone falls is directly proportional to the square of the time, t seconds. It falls 44.1 m in 3 seconds.

- a) Find a formula for d in terms of t .
- b) How long does it take to fall 78.4 m?

a) $44.1 = k \times 9, d = 4.9t^2$

b) $t^2 = 78.4 \div 4.9 = 16, t = 4$ s

Proportion 2

revision mat answers

6 Inverse proportion: $y = \frac{k}{x}$

y is inversely proportional to x^2 . When $x = 4$, $y = 5$.

- a) Find a formula for y in terms of x .
- b) Find y when $x = 10$.

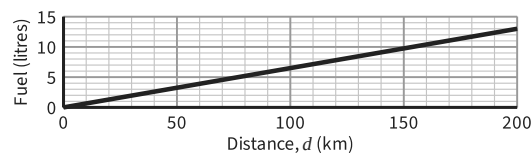
a) $k = 5 \times 16 = 80, y = \frac{80}{x^2}$

b) $80 \div 100 = 0.8$

7 Direct proportion graphs

The fuel, f litres, that a car uses for d km.

- a) Write a formula for f in terms of d .
- b) How far can it go on 45 litres, to the nearest km?



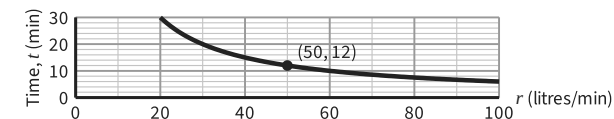
a) $13 \div 200 = 0.065, f = 0.065d$

b) $45 \div 0.065 = 692.3\dots$, 692 km

8 Inverse proportion graphs

The time, t minutes, to fill a tank at r litres a minute.

- a) Use the graph to find a formula for t in terms of r .
- b) What rate fills the tank in 8 minutes?



a) $50 \times 12 = 600, t = \frac{600}{r}$

b) $600 \div 8 = 75$ litres a minute