

# Solve problems with inverse proportion

**1** It takes 8 people 12 hours to build a wall.

a) Calculate how long it would take the following number of people to build the same sized wall.

i) 16 people

iii) 32 people

hours

hours

ii) 4 people

iv) 1 person

hours

hours

b) What assumption have you made?

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**2** One machine can print 10,000 pages in one hour.

a) How long would it take the following number of machines to print 10,000 pages?

i) 2 machines

iii) 10 machines

minutes

minutes

ii) 4 machines

iv) 15 machines

minutes

minutes

b) What assumption have you made?



**3** A train travels at a constant speed from Halifax to London.

The table shows the time it takes for the train to complete the journey at different speeds.

Speed (km/h)	70	100	112	140	200
Time (hours)	4	2.8	2.5	2	1.4

a) Calculate the distance of the train journey.

km

b) When the speed of the train increases, what do you notice about the time it takes to complete the journey?

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c) Whitney says, "Speed and time are in direct proportion to each other."

Dora says, "Speed and time are in inverse proportion."

Who is correct?

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Explain why.

**4** Decide whether the relationships are directly proportional, inversely proportional or neither.

	Type of relationship
number of teachers and the time it takes to mark 5,000 exam papers. Assume the teachers mark at the same rate.	
the perimeter of a square and its width	
the price of a banana and the number of bananas bought	
cost of a taxi journey and number of miles travelled. The price of a taxi journey is calculated using: £2.00 charge + £0.50 for every mile travelled.	



5  $x$  is inversely proportional to  $y$  for each table of values.

For each table, calculate  $xy$ .

a)

$x$	1	5	10	100
$y$	50	10	5	0.5
$xy$				

c)

$x$	2	4	20	500
$y$	0.5	0.25	0.05	0.002
$xy$				

b)

$x$	0.25	2	4	12
$y$	48	6	3	1
$xy$				

d)

$x$	0.02	0.1	8	20
$y$	50	10	0.125	0.05
$xy$				

What do you notice about  $xy$ ? Why do you think this is?

6 State whether  $f$  and  $g$  are in direct proportion or inverse proportion.

a)

$f$	1 cm	5 cm	10 cm	1 m
$g$	10 mm	50 mm	100 mm	1,000 mm

b)

$f$	10 kg/cm <sup>3</sup>	5 kg/cm <sup>3</sup>	2 kg/cm <sup>3</sup>	100 kg/cm <sup>3</sup>
$g$	1 cm <sup>3</sup>	2 cm <sup>3</sup>	5 cm <sup>3</sup>	0.1 cm <sup>3</sup>

c)

$f$	1 worker	2 workers	4 workers	5 workers
$g$	100 hours	50 hours	25 hours	20 hours

d)

$f$	\$1	\$200	\$500	\$0.50
$g$	60p	£120	£300	30p

7 2 farmers can shear 6 sheep in 9 minutes.

a) If there were twice as many farmers, how many sheep would you expect to be sheared in 9 minutes?

b) How many farmers would be needed to shear the same number of sheep in half the time?

8 On Monday, 5 painters took 7 hours and 36 minutes to paint an office. On Tuesday, 8 painters are painting another office the same size.

a) Assuming the painters work at the same rate, how long will it take 8 painters to paint the office?  
Give your answer in hours and minutes.

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b) Each painter is paid £12 per hour.  
How much will each painter be paid on Tuesday?

£

