



Graphs of real-life situations

- Properties of direct proportionality
- Using graphs to find the relationship between two variables
- Writing a ratio in the form $1 : n$
- Converting a ratio to an equation linking two variables

Keywords

You should know

explanation 1a

explanation 1b

- 1** In December 2007, the exchange rate from pounds (£) to US dollars (\$) was approximately $1 : 2$. Therefore £1 could be exchanged for \$2.

- a** Copy and complete this exchange rate table.

Pounds (£)	0	5	10	15	20
US dollars (\$)		10			

- b** Plot a graph showing the relationship between pounds and dollars.

- 2** In August 2007, the exchange rate from pounds (£) to euros (€) was approximately $2 : 3$. Therefore £2 could be exchanged for €3.

- a** Copy and complete this exchange rate table.

Pounds (£)	0	10	20	50	100
Euros (€)		15			

- b** Plot a graph to show the relationship between pounds and euros.

- c** Use your graph to estimate the number of pounds that would be exchanged for €45.

- 3** A car is driving at a constant speed. The table shows the total number of kilometres the car has travelled after different lengths of time.

Time (h)	0	1	2	3	4	5	6
Distance (km)			180		360	450	

- Calculate the speed, in km/h, of the car.
- Copy and complete the table.
- Plot a graph showing the relationship between time and distance travelled.
- When the car is travelling at a constant speed, are time and distance directly proportional? How do you know?
- Use your graph to estimate the distance travelled after 3 hours 30 minutes.

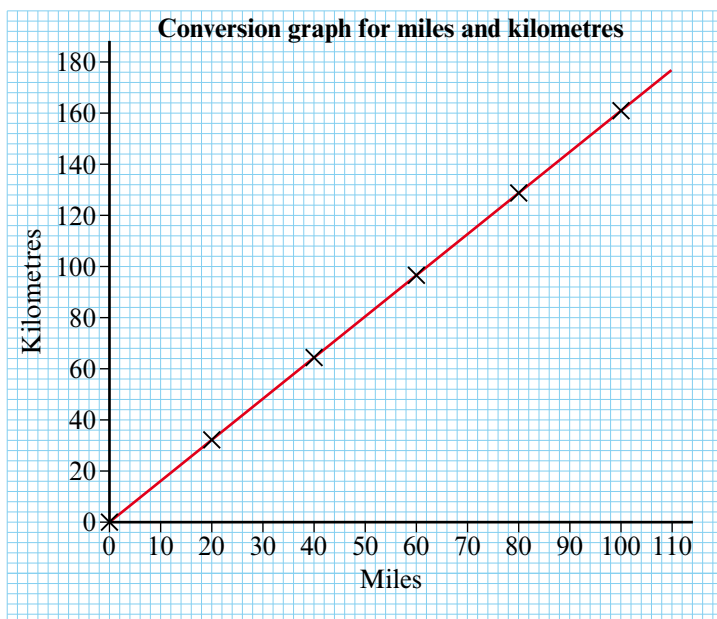
$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

explanation 2a

explanation 2b

explanation 2c

- 4** This graph can be used to convert between miles and kilometres.



- From the graph find the number of kilometres equivalent to 100 miles.
- Find the number of kilometres in 1 mile.
- Use your answer to part **b** to calculate the number of kilometres in 70 miles.
- Find the number of miles equivalent to 1 kilometre.
- Use your answer to part **d** to calculate the number of miles in 250 km.

5 Write each ratio in the form $1:n$.

a 2:5

b 3:10

c 4:5

d 9:15

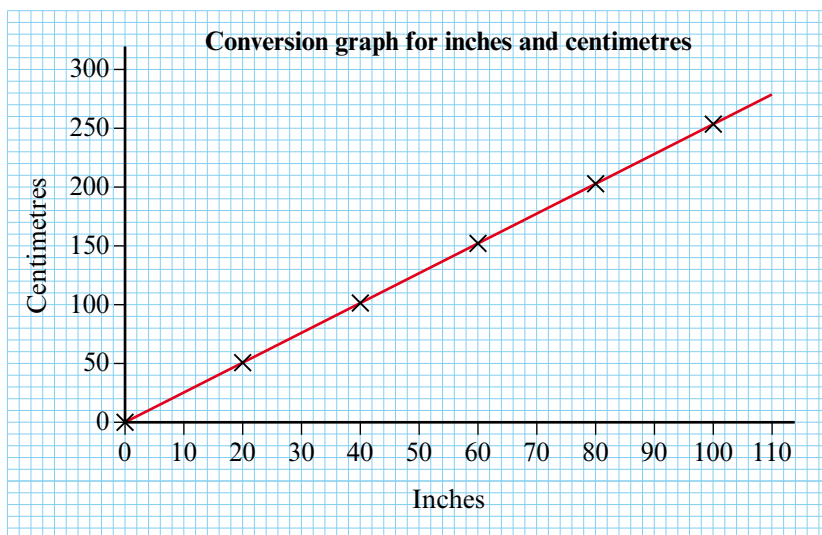
e 15:6

f 25:6

g 1.5:1

h 9:5

6 This graph can be used to convert between inches and centimetres.



a Use the graph to find the number of centimetres equivalent to 100 inches.

b Calculate the number of centimetres equivalent to 1 inch.

c Write the ratio 1 cm : 1 inch in the form $1:n$.

d Use your answer to part **b** to calculate the number of centimetres equivalent to 85 inches.

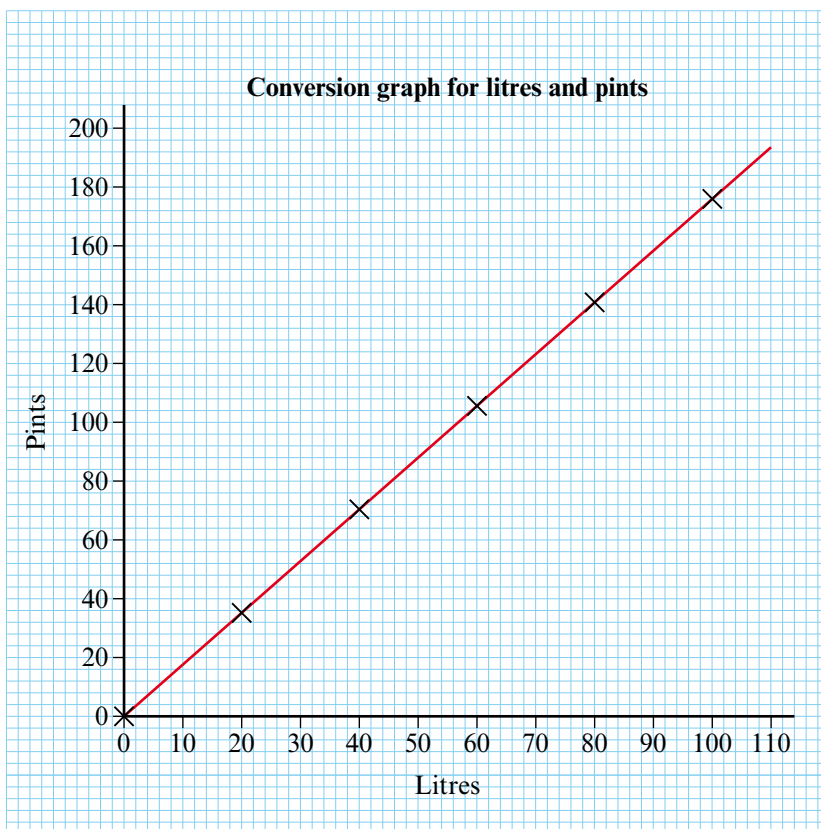
e Use the graph to find the number of inches equivalent to 100 cm.

f Calculate the number of inches equivalent to 1 cm.

g Write the ratio 1 inch : 1 cm in the form $1:n$.

h Use your answer to part **f** to calculate the number of inches equivalent to 175 cm.

7 This graph can be used to convert between litres and pints.



- a** Use the graph to find the number of pints equivalent to 100 litres.
- b** Calculate the number of pints equivalent to 1 litre.
- c** Write the ratio 1 pint : 1 litre in the form $1 : n$.
- d** Use your answer to part **b** to calculate the number of pints equivalent to 72 litres.
- e** Use the graph to find the number of litres equivalent to 100 pints.
- f** Calculate the number of litres equivalent to 1 pint.
- g** Write the ratio 1 litre : 1 pint in the form $1 : n$.
- h** Write the relationship between a capacity in litres, L , and the equivalent capacity in pints, P , as an equation.
- i** A farmer looked up the average yearly milk yield for a dairy cow in the UK and found it was 11 000 pints.
Convert the average yearly milk yield to litres.