# Using graphs

- Using graphs to convert one quantity into another
- Using graphs to solve equations

Keywords

You should know

explanation 1

1 A teacher uses this graph to convert test marks to percentages.

a Use the red lines to help you write a mark of 21 as a percentage.

b Write these marks as percentages.

i 28   ii 14   iii 17.5

c What was the highest possible test mark?

d The lowest percentage scored was 20%. How many marks did this person score?

e The highest percentage scored was 90%. How many marks did this person score?
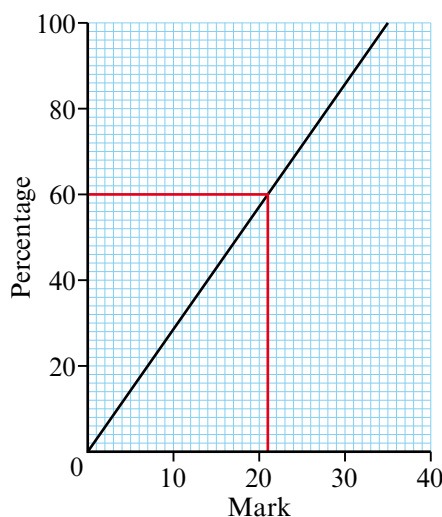
2 You can use this graph to convert between inches (in) and centimetres (cm).
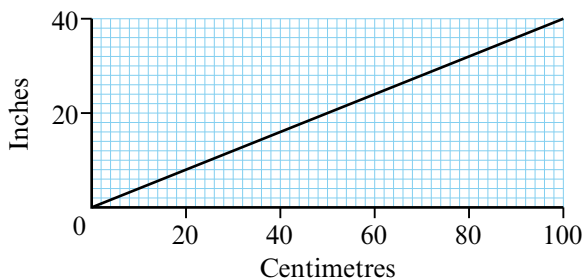
a Write these measurements to the nearest inch.

i 20 cm   ii 90 cm

iii 55 cm   iv 32 cm
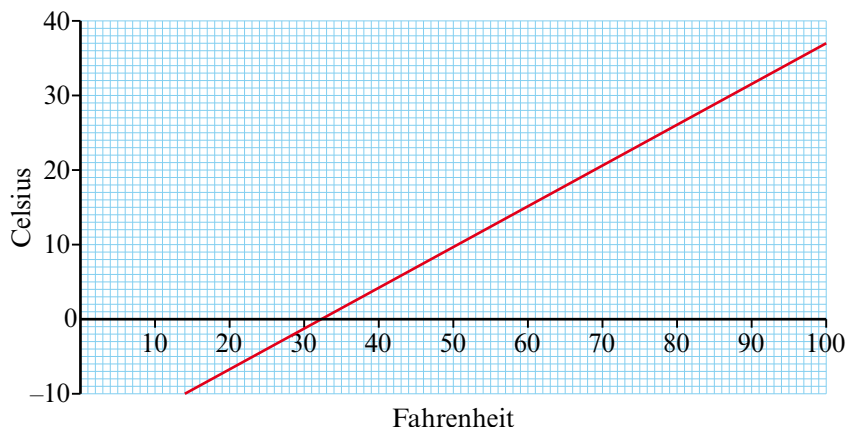

b Write these measurements to the nearest centimetre.

i 12 in   ii 20 in   iii 30 in   iv 16 in

c Write these measurements in order of size, smallest first.

21 in, 46 cm, 49.2 cm, 19 in

3 You can use this graph to convert between temperatures in degrees
Celsius (°C) and degrees Fahrenheit (°F).

Fahrenheit

a A typical classroom temperature is around 20°C. Write this in Fahrenheit.

b On a summer's day, the temperature might be 86°F. Write this in Celsius.

c At what temperature in Fahrenheit does the graph cross the horizontal axis?

d The temperature one morning in winter is −5°C. Write this in Fahrenheit.

e Human body temperature is 98.4°F. Write this in Celsius to the nearest degree.

**4** 10 kg is approximately 22 lb and this is shown by the cross on the diagram.

Pounds
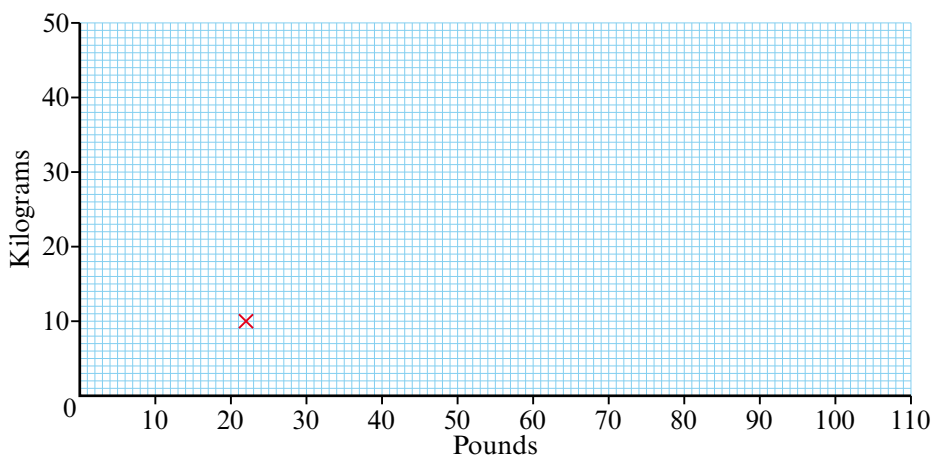
a Copy the diagram. Plot three more points. Draw a graph through the
plotted points.

b Copy and complete these conversions to the nearest whole number.

    i   15 kg = ☐ lb   **ii**   45 kg = ☐ lb

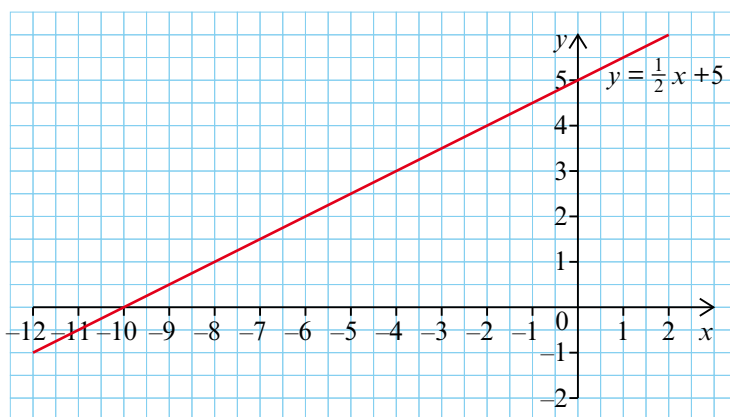   **iii** 37 lb = ☐ kg   **iv** 101 lb = ☐ kg

explanation 2

5 The diagram shows the graph of $y = 2x - 3$.

   a Use the red lines to help you solve the equation
      $2x - 3 = 5$.

   b Use the graph to solve these equations.

      i $2x - 3 = 1$ **ii** $2x - 3 = 0$

      iii $2x - 3 = -3$ **iv** $2x - 3 = -1$
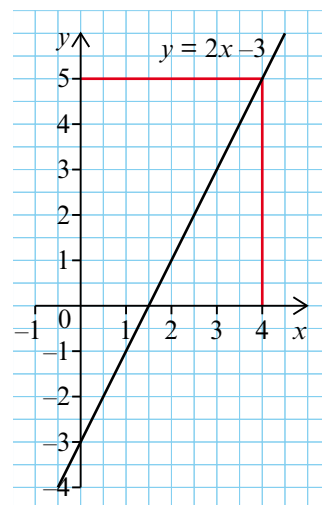
6 The diagram shows the graph of $y = \frac{1}{2}x + 5$.

   a Use the graph to solve these equations.

      i $\frac{1}{2}x + 5 = 4$ **ii** $\frac{1}{2}x + 5 = 1$ **iii** $\frac{1}{2}x + 5 = 0$

      iv $\frac{1}{2}x + 5 = 2.5$ **v** $\frac{1}{2}x + 5 = 5$ **vi** $\frac{1}{2}x + 5 = -1$

   b Which equation in part **a** is equivalent to the equation $\frac{1}{2}x + 17 = 16$?

   c Copy and complete. $\frac{1}{2}x + 21 = 19.5$

$$\frac{1}{2}x + 5 = \square$$
$$x = \square$$

7 a Copy and complete the table for the equation
$y = 10 - 4x$.

x	-1	0	1
y	14		

b Plot the points and use them to draw the line
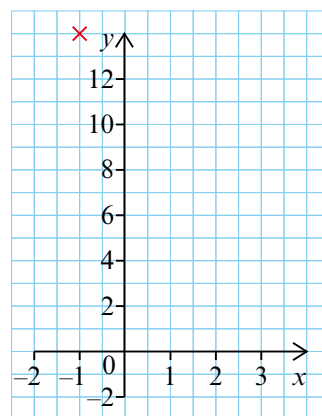$y = 10 - 4x$.

c Use your graph to solve these equations.

   i $10 - 4x = 2$ **ii** $10 - 4x = 0$

  iii $10 - 4x = 4$ **iv** $10 - 4x = -2$

8 a Copy and complete the table for the
equation $y = \dfrac{x + 3}{2}$.

x	-5	0	5
y	-1		

b Plot the points and use them to
draw the line $y = \dfrac{x + 3}{2}$.

c Use your graph to solve these
equations.

   i $\dfrac{x + 3}{2} = 3$ **ii** $\dfrac{x + 3}{2} = 1.5$ **iii** $\dfrac{x + 3}{2} = 0$

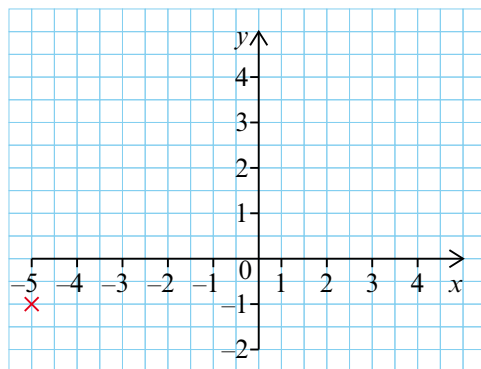 **iv** $\dfrac{x + 3}{2} = 2$ **v** $\dfrac{x + 3}{2} = 3.5$ **vi** $\dfrac{x + 3}{2} = -0.5$

d Copy and complete. $\dfrac{x + 3}{2} + 7 = 6$

$$\frac{x + 3}{2} = \square$$

$$x = \square$$

9 a Copy and complete the table for the equation $v = 3 - \dfrac{t}{2}$.

t	0	2	4
v			

b Draw the graphs of $v = 3 - \dfrac{t}{2}$ and $v = t$ on the same axes.

c Solve the equation $3 - \dfrac{t}{2} = 0$.

d Use your graphs to solve the equation $t = 3 - \dfrac{t}{2}$.