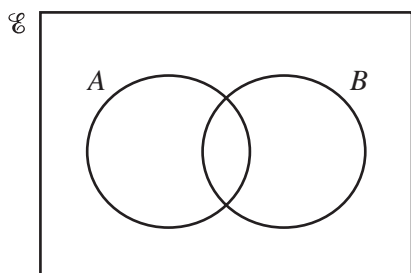
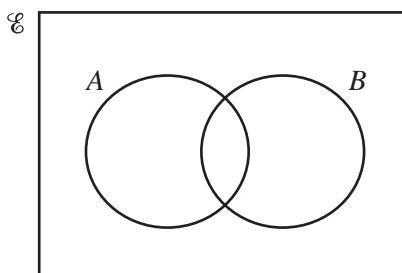


- 1 Shade the required region on each Venn diagram.



$A' \cup B$



$A' \cap B'$

[2]

- 2 Factorise completely.

$$kp + 3k + mp + 3m$$

Answer [2]

- 3 The first five terms of a sequence are shown below.

13 9 5 1 -3

Find the n th term of this sequence.

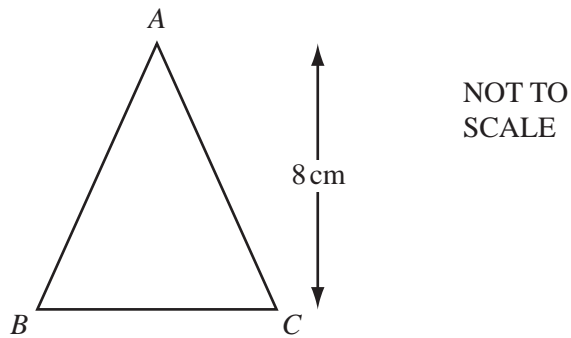
Answer [2]

4 Calculate $(4.3 \times 10^8) + (2.5 \times 10^7)$.

Give your answer in standard form.

Answer [2]

5



Triangle ABC has a height of 8 cm and an area of 42 cm^2 .

Calculate the length of BC .

Answer $BC =$ cm [2]

- 6 George and his friend Jane buy copies of the same book on the internet. George pays \$16.95 and Jane pays £11.99 on a day when the exchange rate is \$1 = £0.626.

Calculate, in dollars, how much more Jane pays.

Answer \$ [2]

- 7 (a) Use your calculator to work out $\sqrt{65} - 1.7^2$.

Write down all the numbers displayed on your calculator.

Answer(a) [1]

- (b) Write your answer to **part (a)** correct to 2 significant figures.

Answer(b) [1]

- 8 Joe measures the side of a square correct to 1 decimal place. He calculates the **upper** bound for the area of the square as 37.8225 cm^2 .

Work out Joe's measurement for the side of the square.

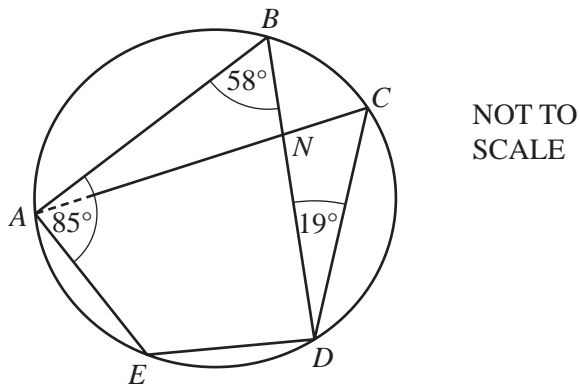
Answer cm [2]

- 9 A car, 4.4 metres long, has a fuel tank which holds 65 litres of fuel when full.
The fuel tank of a mathematically similar model of the car holds 0.05 litres of fuel when full.

Calculate the length of the model car in centimetres.

Answer cm [3]

10



A, B, C, D and E are points on a circle.
Angle $ABD = 58^\circ$, angle $BAE = 85^\circ$ and angle $BDC = 19^\circ$.
 BD and CA intersect at N .

Calculate

- (a) angle BDE ,

Answer(a) Angle $BDE = \dots\dots\dots$ [1]

- (b) angle AND .

Answer(b) Angle $AND = \dots\dots\dots$ [2]

- 11 Without using a calculator, work out $\frac{6}{7} \div 1\frac{2}{3}$.

Write down all the steps in your working.

Answer [3]

- 12 Solve the equation.

$$5(2y - 17) = 60$$

Answer $y =$ [3]

- 13 Carol invests \$6250 at a rate of 2% per year compound interest.

Calculate the **total** amount Carol has after 3 years.

Answer \$ [3]

- 14 y is inversely proportional to x^3 .
 $y = 5$ when $x = 2$.

Find y when $x = 4$.

Answer $y = \dots\dots\dots$ [3]

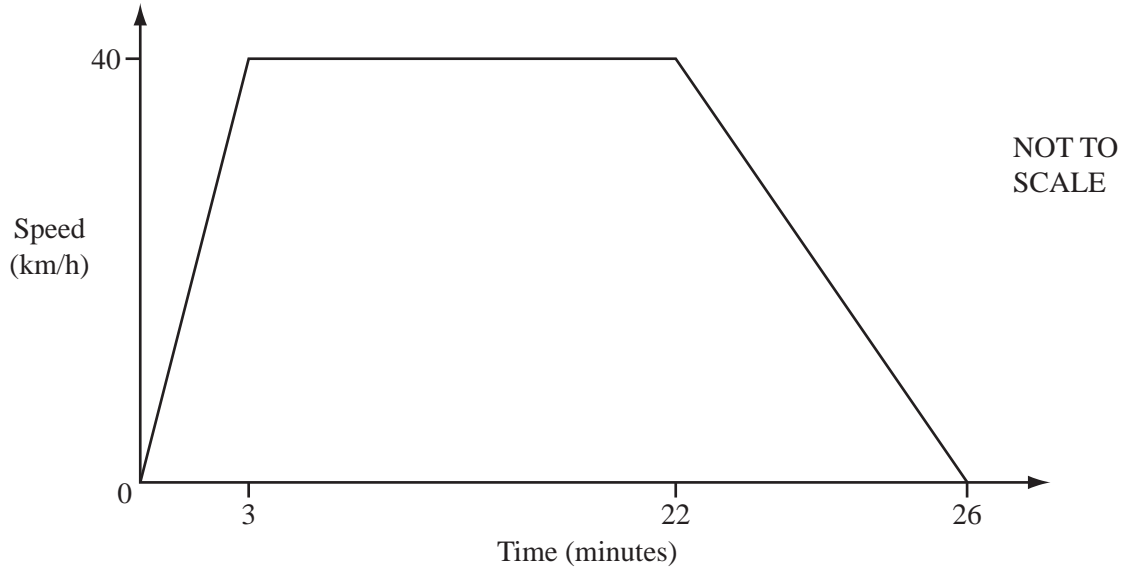
- 15 Use the quadratic equation formula to solve

$$2x^2 + 7x - 3 = 0 .$$

Show all your working and give your answers correct to 2 decimal places.

Answer $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [4]

16



The diagram shows the speed-time graph of a train journey between two stations.

The train accelerates for 3 minutes, travels at a constant maximum speed of 40km/h, then takes 4 minutes to slow to a stop.

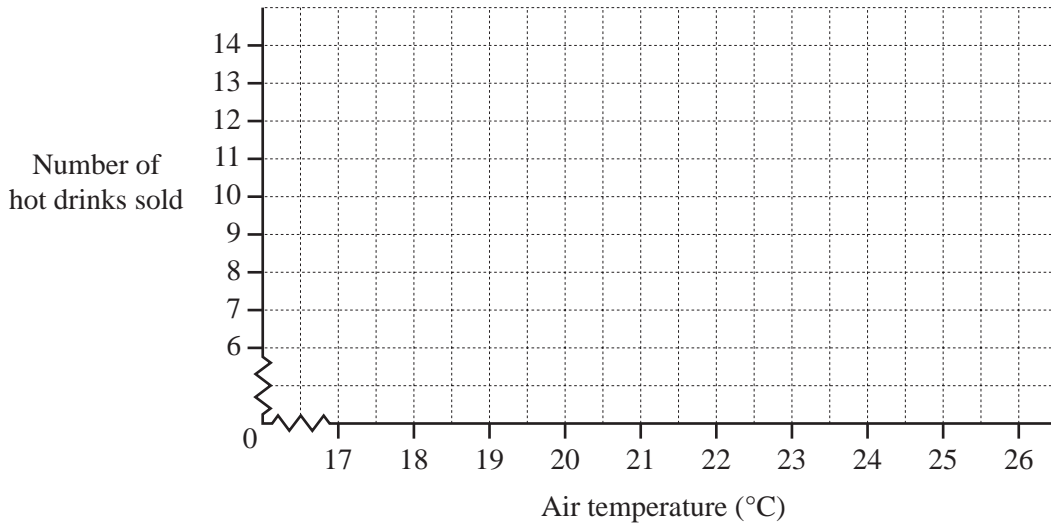
Calculate the distance in kilometres between the two stations.

Answer km [4]

- 17 The owner of a small café records the average air temperature and the number of hot drinks he sells each day for a week.

Air temperature (°C)	18	23	19	23	24	25	20
Number of hot drinks sold	12	8	13	10	9	7	12

- (a) On the grid, draw a scatter diagram to show this information.



[2]

- (b) What type of correlation does your scatter diagram show?

Answer(b) [1]

- (c) Draw a line of best fit on the grid.

[1]

- 18 Solve $6x + 3 < x < 3x + 9$ for **integer** values of x .

Answer [4]



Scale: 1 cm to 8 m

The rectangle $ABCD$ is a scale drawing of a rectangular football pitch.
The scale used is 1 centimetre to represent 8 metres.

- (a) Construct the locus of points 40 m from A and inside the rectangle. [2]
- (b) Using a straight edge and compasses only, construct the perpendicular bisector of DB . [2]
- (c) Shade the region on the football pitch which is more than 40 m from A **and** nearer to D than to B . [1]
-

20 The heights, in metres, of 200 trees in a park are measured.

Height (h m)	$2 < h \leq 6$	$6 < h \leq 10$	$10 < h \leq 13$	$13 < h \leq 17$	$17 < h \leq 19$	$19 < h \leq 20$
Frequency	23	47	45	38	32	15

(a) Find the interval which contains the median height.

Answer(a) [1]

(b) Calculate an estimate of the mean height.

Answer(b) m [4]

(c) Complete the cumulative frequency table for the information given in the table above.

Height (h m)	$2 < h \leq 6$	$h \leq 10$	$h \leq 13$	$h \leq 17$	$h \leq 19$	$h \leq 20$
Cumulative frequency	23					

[2]

Question 21 is printed on the next page.

21

$f(x) = 5x + 4$

$g(x) = \frac{1}{2x}, \quad x \neq 0$

$h(x) = \left(\frac{1}{2}\right)^x$

Find

(a) $fg(5)$,*Answer(a)* [2](b) $gg(x)$ in its simplest form,*Answer(b)* $gg(x) =$ [2](c) $f^{-1}(x)$,*Answer(c)* $f^{-1}(x) =$ [2](d) the value of x when $h(x) = 8$.*Answer(d)* $x =$ [2]

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