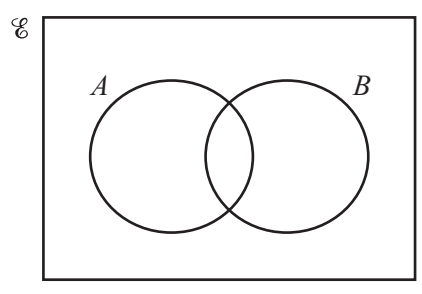


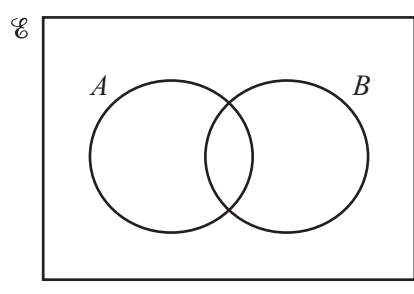


2

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.

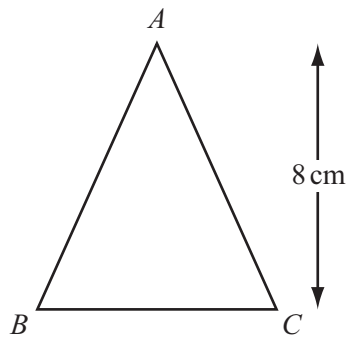
Answer ..... [2]

3

- 4 Calculate  $(4.3 \times 10^8) + (2.5 \times 10^7)$ .  
Give your answer in standard form.

Answer ..... [2]

5



NOT TO  
SCALE

Triangle  $ABC$  has a height of 8 cm and an area of  $42 \text{ cm}^2$ .

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<sup>2</sup>.

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

Answer ..... cm [2]

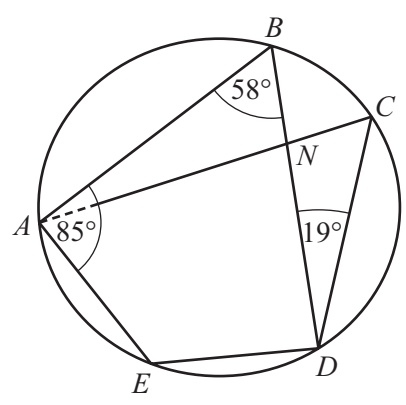
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- 9 A car, 4.4 metres long, has a fuel tank which holds 65 litres of fuel when full.  
The fuel tank of a mathematically similar model of the car holds 0.05 litres of fuel when full.

Calculate the length of the model car in centimetres.

Answer ..... cm [3]

10



NOT TO  
SCALE

$A, B, C, D$  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  $BDE =$  ..... [1]

- (b) angle  $AND$ .

Answer(b) Angle  $AND =$  ..... [2]

6

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

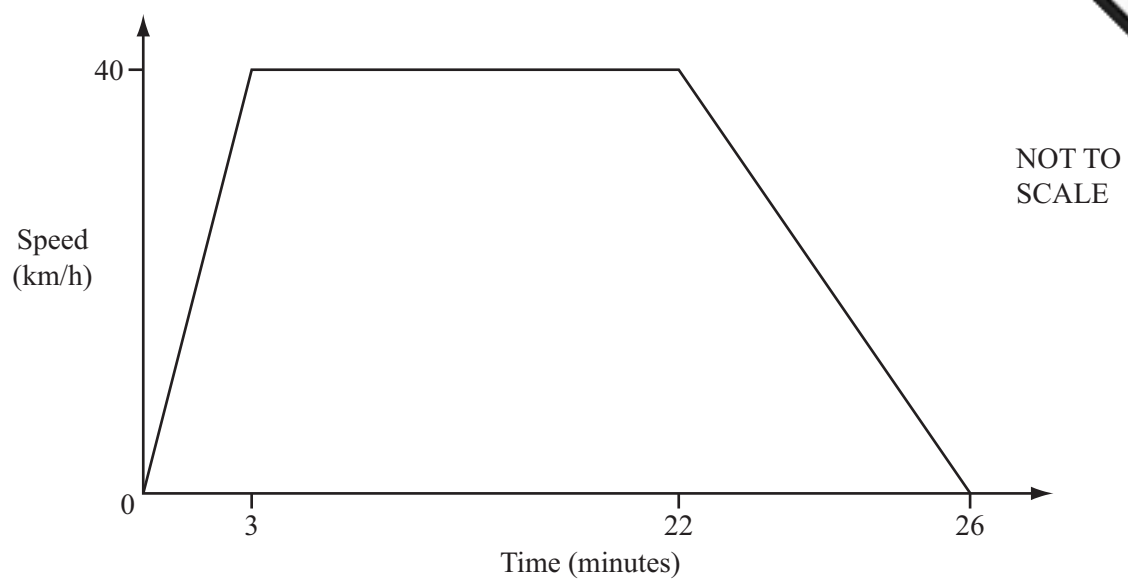
$$2x^2 + 7x - 3 = 0 .$$

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 40 km/h, then takes 4 minutes to slow to a stop.

Calculate the distance in kilometres between the two stations.

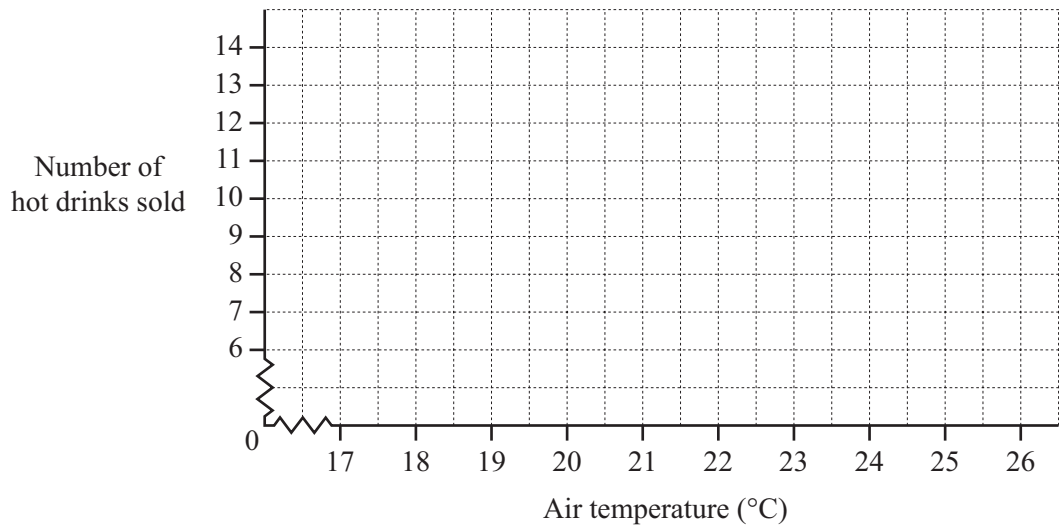
Answer ..... km [4]



17 The owner of a small café records the average air temperature and the number of hot drinks sold 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?

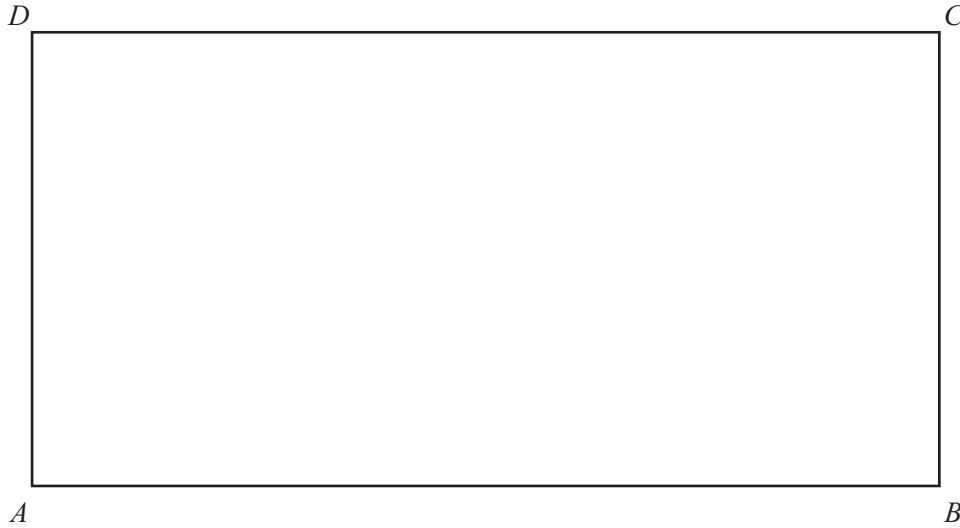
Answer(b) ..... [1]

(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

$f(x) = 5x + 4$

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

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

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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