



1 Write down the difference in temperature between  $8^{\circ}\text{C}$  and  $-9^{\circ}\text{C}$ .

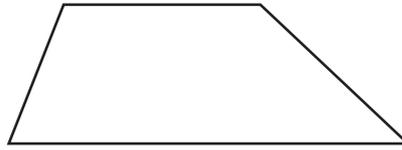
Answer .....  $^{\circ}\text{C}$  [1]

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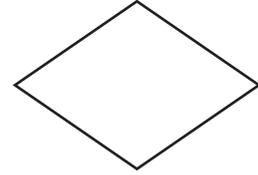
2



Parallelogram



Trapezium



Rhombus

Write down which one of these shapes has

- rotational symmetry of order 2
- and**
- no line symmetry.

Answer ..... [1]

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3 Carlos changed \$950 into euros (€) when the exchange rate was  $\text{€}1 = \$1.368$ .

Calculate how many euros Carlos received.

Answer € ..... [2]

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4  $\vec{AB} = \begin{pmatrix} -3 \\ 5 \end{pmatrix}$

Find  $|\vec{AB}|$ .

Answer ..... [2]

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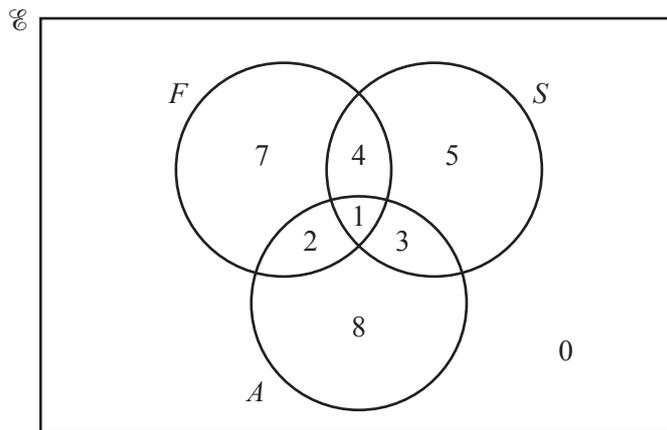
5 Calculate the volume of a hemisphere with radius 5 cm.

[The volume,  $V$ , of a sphere with radius  $r$  is  $V = \frac{4}{3}\pi r^3$ .]

Answer ..... cm<sup>3</sup> [2]

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6 The Venn diagram shows the number of students who study French ( $F$ ), Spanish ( $S$ ) and Arabic ( $A$ ).



(a) Find  $n(A \cup (F \cap S))$ .

Answer(a) ..... [1]

(b) On the Venn diagram, shade the region  $F' \cap S$ . [1]

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7

$$\mathbf{M} = \begin{pmatrix} 3 & -4 \\ -2 & 4 \end{pmatrix}$$

$$\mathbf{N} = \begin{pmatrix} 5 & 0 \\ 1 & 2 \end{pmatrix}$$

Calculate  $\mathbf{MN}$ .

*Answer*  $\left( \begin{array}{cc} & \\ & \end{array} \right)$  [2]

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- 8 Robert buys a car for \$8000.  
At the end of each year the value of the car has decreased by 10% of its value at the beginning of that year.  
Calculate the value of the car at the end of 7 years.

*Answer* \$ ..... [2]

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- 9 The scale on a map is 1 : 50 000.  
The area of a field on the map is 1.2 square centimetres.  
Calculate the actual area of the field in square kilometres.

*Answer* ..... km<sup>2</sup> [2]

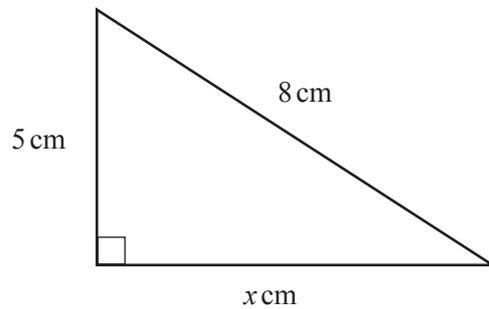
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- 10 Jason receives some money for his birthday.  
He spends  $\frac{11}{15}$  of the money and has \$14.40 left.

Calculate how much money he received for his birthday.

Answer \$ ..... [3]

11



NOT TO  
SCALE

Calculate the value of  $x$ .

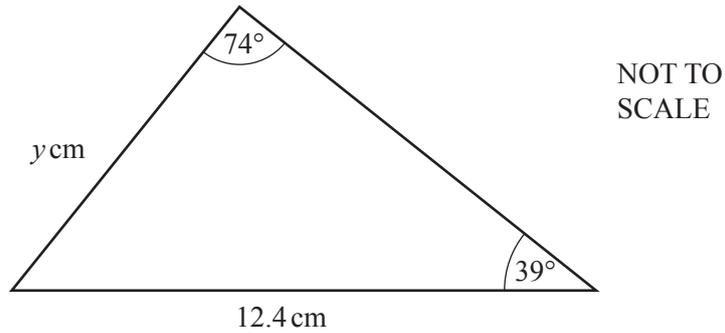
Answer  $x =$  ..... [3]

- 12 Without using your calculator, work out  $2\frac{1}{4} - \frac{11}{12}$ .

You must show all your working and give your answer as a fraction in its lowest terms.

Answer ..... [3]

13



Calculate the value of  $y$ .

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

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- 14 Jasjeet and her brother collect stamps.  
When Jasjeet gives her brother 1% of her stamps, she has 2475 stamps left.

Calculate how many stamps Jasjeet had originally.

*Answer*  $\dots\dots\dots$  [3]

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15 Factorise

(a)  $9w^2 - 100$ ,

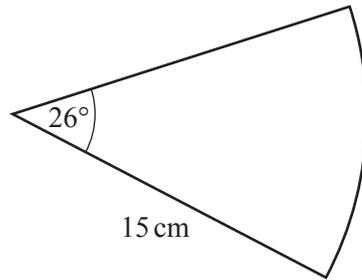
*Answer(a)*  $\dots\dots\dots$  [1]

(b)  $mp + np - 6mq - 6nq$ .

*Answer(b)*  $\dots\dots\dots$  [2]

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16

NOT TO  
SCALE

The diagram shows a sector of a circle with radius 15 cm.

Calculate the perimeter of this sector.

*Answer* ..... cm [3]

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- 17  $y$  is directly proportional to the square of  $(x - 1)$ .  
 $y = 63$  when  $x = 4$ .

Find the value of  $y$  when  $x = 6$ .

*Answer*  $y =$  ..... [3]

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- 18 A rectangle has length 5.8 cm and width 2.4 cm, both correct to 1 decimal place.

Calculate the lower bound and the upper bound of the perimeter of this rectangle.

*Answer* Lower bound ..... cm

Upper bound ..... cm [3]

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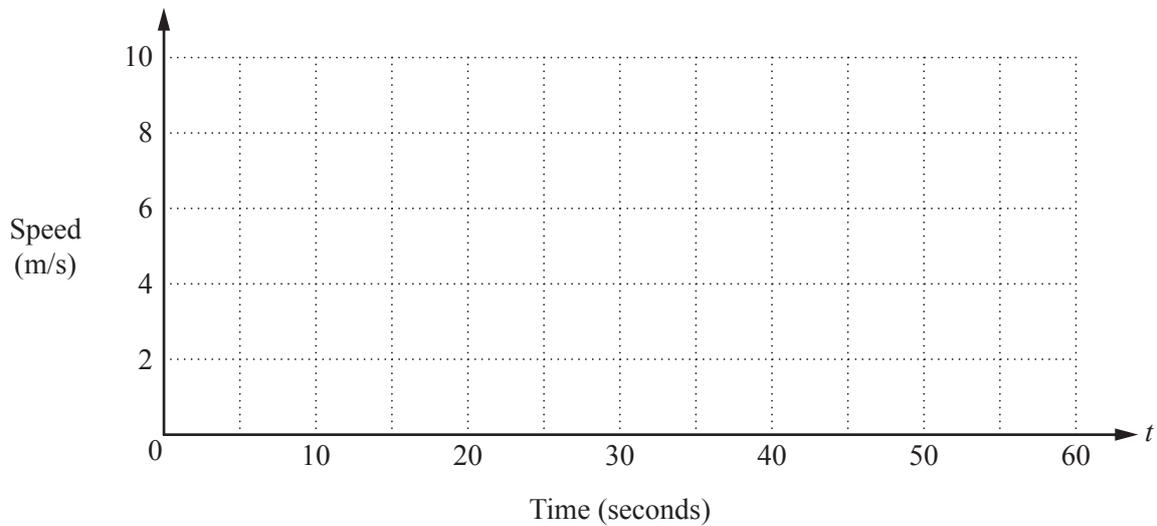
- 19 Solve the equation  $5x^2 - 6x - 3 = 0$ .  
Show all your working and give your answers correct to 2 decimal places.

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

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- 20 A car passes through a checkpoint at time  $t = 0$  seconds, travelling at 8 m/s.  
It travels at this speed for 10 seconds.  
The car then decelerates at a constant rate until it stops when  $t = 55$  seconds.

- (a) On the grid, draw the speed-time graph.



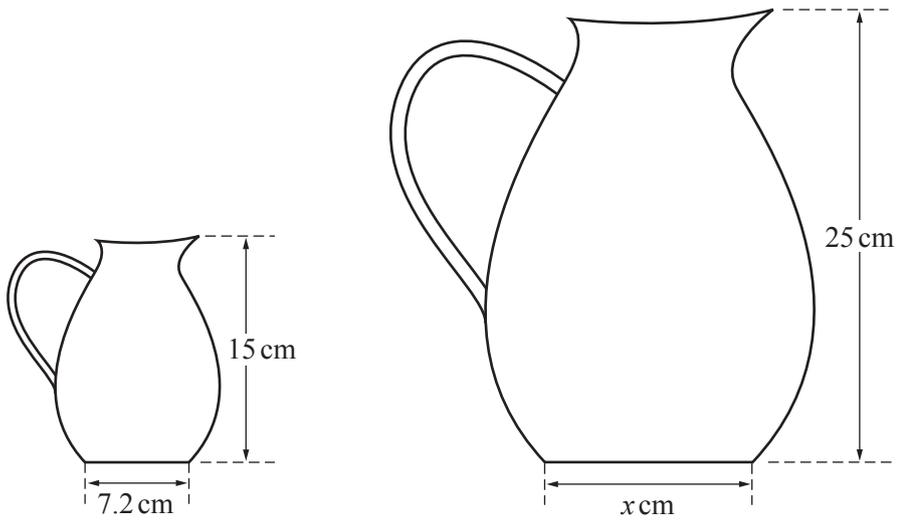
[2]

- (b) Calculate the total distance travelled by the car after passing through the checkpoint.

Answer(b)  $\dots\dots\dots$  m [3]

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21 (a)



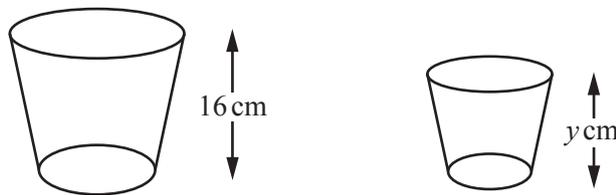
NOT TO SCALE

The diagram shows two jugs that are mathematically similar.

Find the value of  $x$ .

Answer(a)  $x = \dots\dots\dots$  [2]

(b)



NOT TO SCALE

The diagram shows two glasses that are mathematically similar.  
 The height of the larger glass is 16 cm and its volume is  $375 \text{ cm}^3$ .  
 The height of the smaller glass is  $y \text{ cm}$  and its volume is  $192 \text{ cm}^3$ .

Find the value of  $y$ .

Answer(b)  $y = \dots\dots\dots$  [3]

- 22 The table shows information about the numbers of pets owned by 24 students.

Number of pets	0	1	2	3	4	5	6
Frequency	1	2	3	5	7	3	3

- (a) Calculate the mean number of pets.

*Answer(a)* ..... [3]

- (b) Jennifer joins the group of 24 students.  
When the information for Jennifer is added to the table, the new mean is 3.44 .

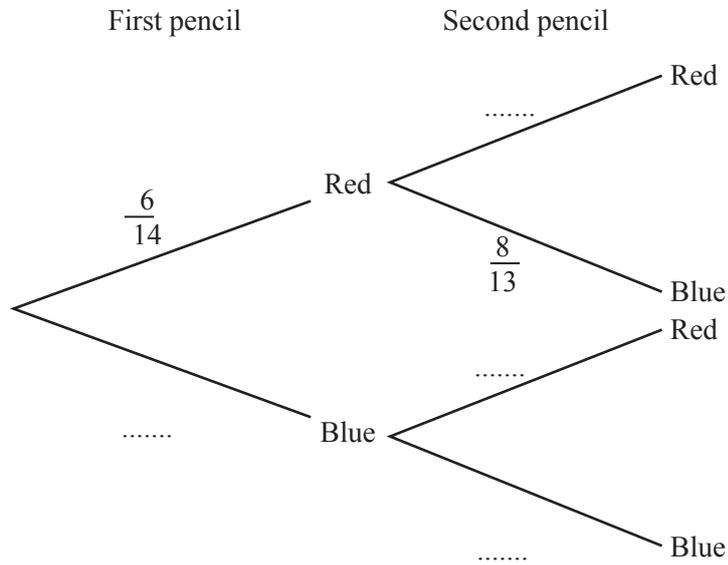
Calculate the number of pets that Jennifer has.

*Answer(b)* ..... [3]

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- 23 A box contains 6 red pencils and 8 blue pencils. A pencil is chosen at random and not replaced. A second pencil is then chosen at random.

(a) Complete the tree diagram.



[2]

(b) Calculate the probability that

(i) both pencils are red,

Answer(b)(i) ..... [2]

(ii) at least one of the pencils is red.

Answer(b)(ii) ..... [3]

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