



1 At a theatre, adult tickets cost \$5 each and child tickets cost \$3 each.

(a) Find the total cost of 110 adult tickets and 85 child tickets.

Answer(a) \$ ..... [2]

(b) The total cost of some tickets is \$750.  
There are 120 adult tickets.

Work out the number of child tickets.

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

(c) The ratio of the **number** of adults to the **number** of children during one performance is

$$\text{adults} : \text{children} = 3 : 2.$$

(i) The total number of adults and children in the theatre is 150.

Find the number of adults in the theatre.

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

(ii) For this performance, find the ratio **total cost** of adult tickets : **total cost** of child tickets.  
Give your answer in its simplest form.

Answer(c)(ii) ..... : ..... [3]

(d) The \$5 cost of an adult ticket is increased by 30%.

Calculate the new cost of an adult ticket.

Answer(d) \$ ..... [2]

(e) The cost of a child ticket is reduced from \$3 to \$2.70.

Calculate the percentage decrease in the cost of a child ticket.

Answer(e) ..... % [3]

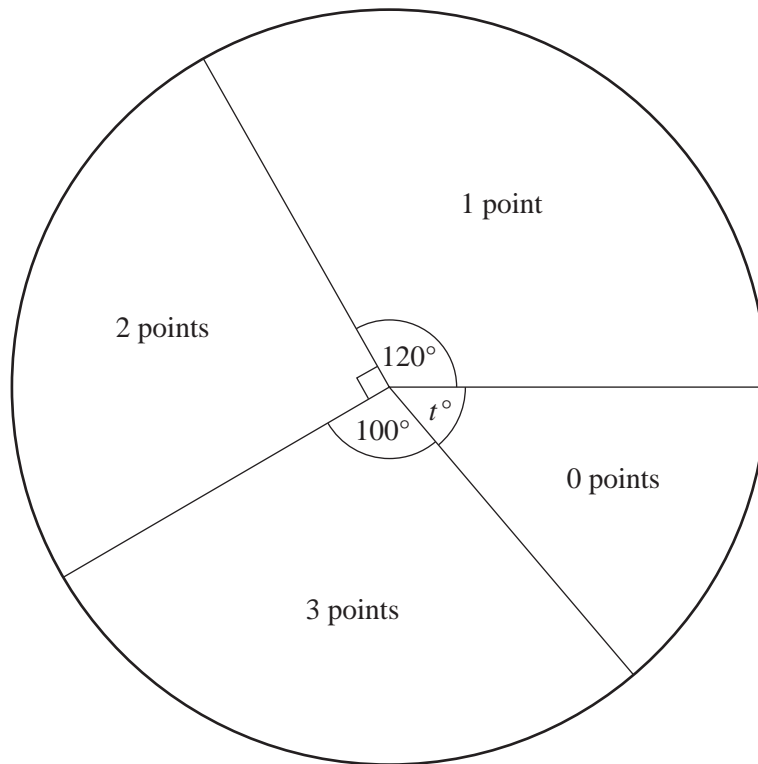


- (a) In the space above, construct triangle  $PQR$  with  $QR = 9$  cm and  $PR = 7$  cm.  
Leave in your construction arcs.  
The line  $PQ$  is already drawn. [2]
- (b) Using a straight edge and compasses only, construct
- (i) the perpendicular bisector of  $PR$ , [2]
- (ii) the bisector of angle  $QPR$ . [2]
- (c) Shade the region inside the triangle  $PQR$  which is  
nearer to  $P$  than to  $R$  **and** nearer to  $PQ$  than to  $PR$ . [1]
- (d) Triangle  $PQR$  is a scale drawing with a scale 1 : 50 000.  
Find the **actual** distance  $QR$ .  
Give your answer in kilometres.

Answer(d) ..... km [2]

- 3 288 students took part in a quiz.  
There were three questions in the quiz.  
Each correct answer scored 1 point.  
The pie chart shows the results.

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- (a) Find the value of  $t$ .

Answer(a)  $t =$  ..... [1]

- (b) Find the number of students who scored 2 points.

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

- (c) Find the modal number of points.

Answer(c) ..... [1]

- (d) (i) Use the information in the pie chart to complete the frequency table for the 288 students.

Number of points	0	1	2	3
Number of students				

[2]

- (ii) Calculate the mean number of points.

*Answer(d)(ii)* ..... [3]

- (e) One student is chosen at random.

Find the probability that this student scored

- (i) 3 points,

*Answer(e)(i)* ..... [1]

- (ii) at least 1 point,

*Answer(e)(ii)* ..... [2]

- (iii) more than 3 points.

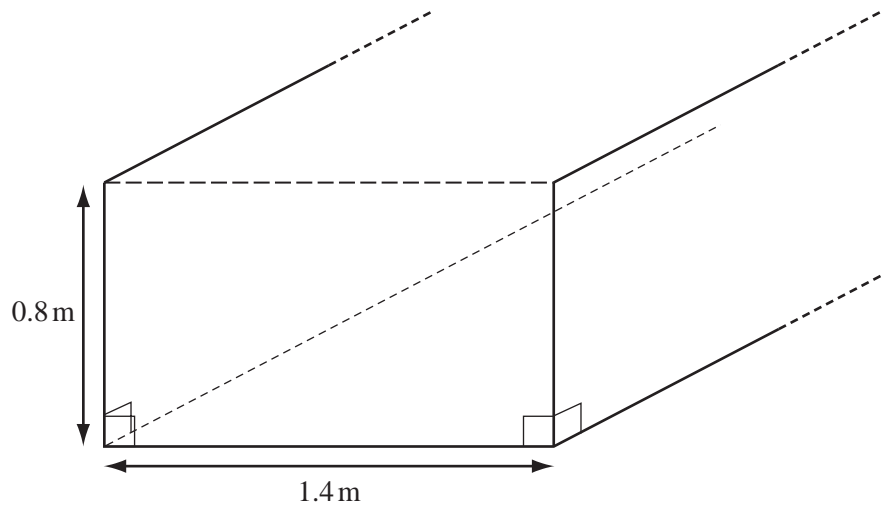
*Answer(e)(iii)* ..... [1]

- (f) 1440 students took part in the same quiz.

How many students would be expected to score 3 points?

*Answer(f)* ..... [1]

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SCALE

The diagram shows part of a trench.  
The trench is made by removing soil from the ground.  
The cross-section of the trench is a rectangle.  
The depth of the trench is 0.8 m and the width is 1.4 m.

(a) Calculate the area of the cross-section.

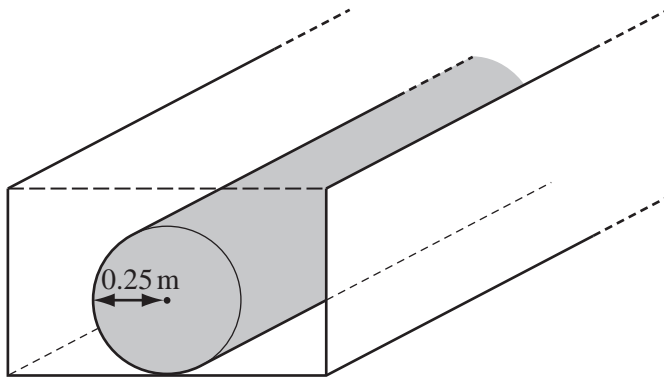
Answer(a) ..... m<sup>2</sup> [2]

(b) The length of the trench is 200 m.

Calculate the volume of soil removed.

Answer(b) ..... m<sup>3</sup> [1]

(c)

NOT TO  
SCALE

A pipe is put in the trench.  
The pipe is a cylinder of radius 0.25 m and length 200 m.

- (i) Calculate the volume of the pipe.

[The volume,  $V$ , of a cylinder of radius  $r$  and length  $l$  is  $V = \pi r^2 l$ .]

Answer(c)(i) ..... m<sup>3</sup> [2]

- (ii) The trench is then filled with soil.  
Find the volume of soil put back into the trench.

Answer(c)(ii) ..... m<sup>3</sup> [1]

- (iii) The soil which is **not used** for the trench is spread evenly over a horizontal area of 8000 m<sup>2</sup>.

Calculate the depth of this soil.  
Give your answer in **millimetres**, correct to 1 decimal place.

Answer(c)(iii) ..... mm [3]

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Use

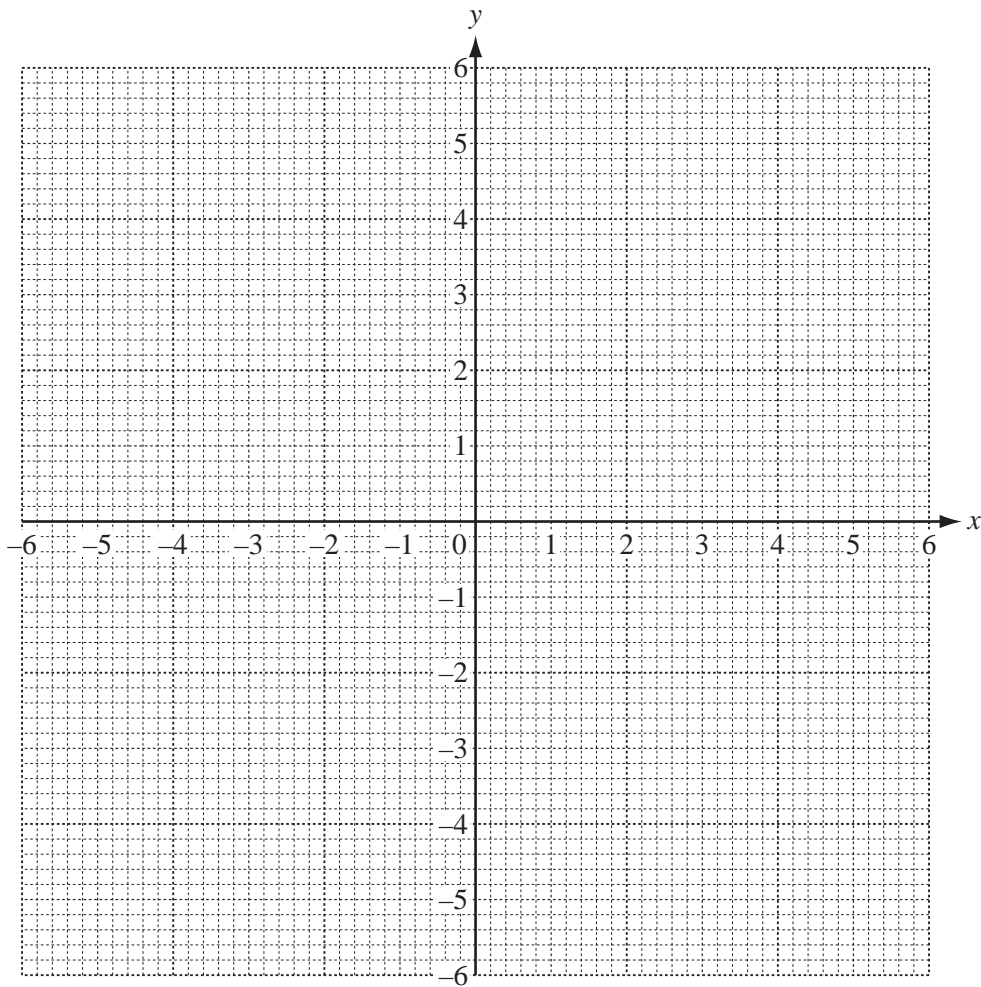
- 5 (a) (i) Complete the table for the function  $y = \frac{6}{x}$ ,  $x \neq 0$ .

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Use

$x$	-6	-5	-4	-3	-2	-1	1	2	3	4	5	6
$y$	-1	-1.2		-2	-3	-6	6	3			1.2	1

[2]

- (ii) On the grid, draw the graph of  $y = \frac{6}{x}$  for  $-6 \leq x \leq -1$  and  $1 \leq x \leq 6$ .



[4]



- (b) (i) Complete the table for the function  $y = \frac{x^2}{2} - 2$ .

$x$	-4	-3	-2	-1	0	1	2	3	4
$y$	6	2.5			-2			2.5	6

[2]

- (ii) On the grid opposite, draw the graph of  $y = \frac{x^2}{2} - 2$  for  $-4 \leq x \leq 4$ .

[4]

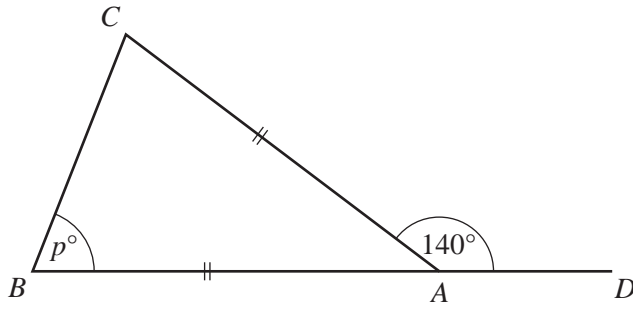
- (c) Write down the co-ordinates of the point of intersection of the two graphs.

Answer(c) ( ..... , ..... ) [2]

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Use

6 (a)

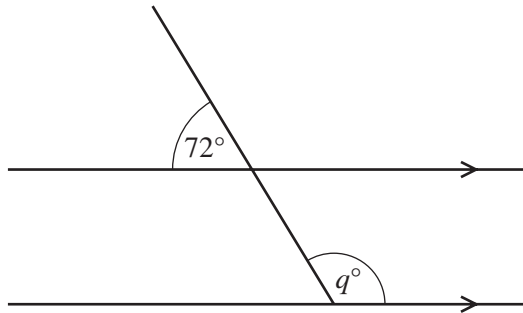


NOT TO SCALE

The diagram shows a triangle  $ABC$  with  $BA$  extended to  $D$ .  
 $AB = AC$  and angle  $CAD = 140^\circ$ .  
 Find the value of  $p$ .

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

(b)

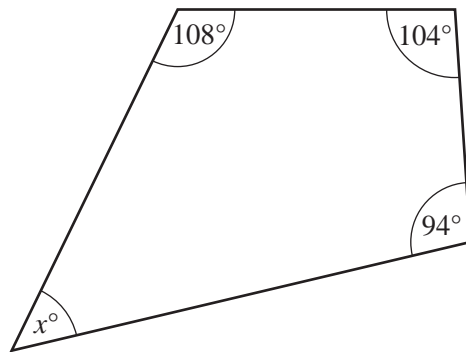


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Find the value of  $q$ .

Answer(b)  $q = \dots\dots\dots$  [2]

(c)



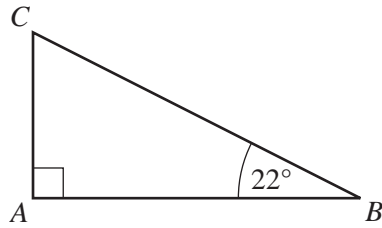
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Find the value of  $x$ .

Answer(c)  $x = \dots\dots\dots$  [1]

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(d)



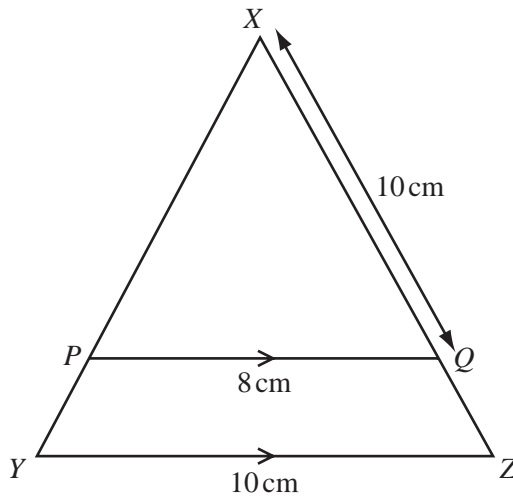
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In triangle  $ABC$ , angle  $A = 90^\circ$  and angle  $B = 22^\circ$ .

Calculate angle  $C$ .

Answer(d) Angle  $C =$  ..... [1]

(e)



NOT TO  
SCALE

In triangle  $XYZ$ ,  $P$  is a point on  $XY$  and  $Q$  is a point on  $XZ$ .  
 $PQ$  is parallel to  $YZ$ .

(i) Complete the statement.

Triangle  $XPQ$  is ..... to triangle  $XYZ$ . [1]

(ii)  $PQ = 8$  cm,  $XQ = 10$  cm and  $YZ = 10$  cm.

Calculate the length of  $XZ$ .

Answer(e)(ii)  $XZ =$  ..... cm [2]

7 (a) Solve the equations.

(i)  $2x + 3 = 15 - x$

*Answer(a)(i)*  $x =$  ..... [2]

(ii)  $\frac{2y-1}{3} = 7$

*Answer(a)(ii)*  $y =$  ..... [2]

(iii)  $2 = \frac{1}{u-1}$

*Answer(a)(iii)*  $u =$  ..... [3]

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(b) Write down equations to show the following.

(i)  $p$  is equal to  $r$  plus two times  $q$ .

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

(ii)  $k$  is equal to the square of the sum of  $l$  and  $m$ .

*Answer(b)(ii)* ..... [2]

(c) Pierre walks for 2 hours at  $w$  km/h and then for another 3 hours at  $(w - 1)$  km/h.

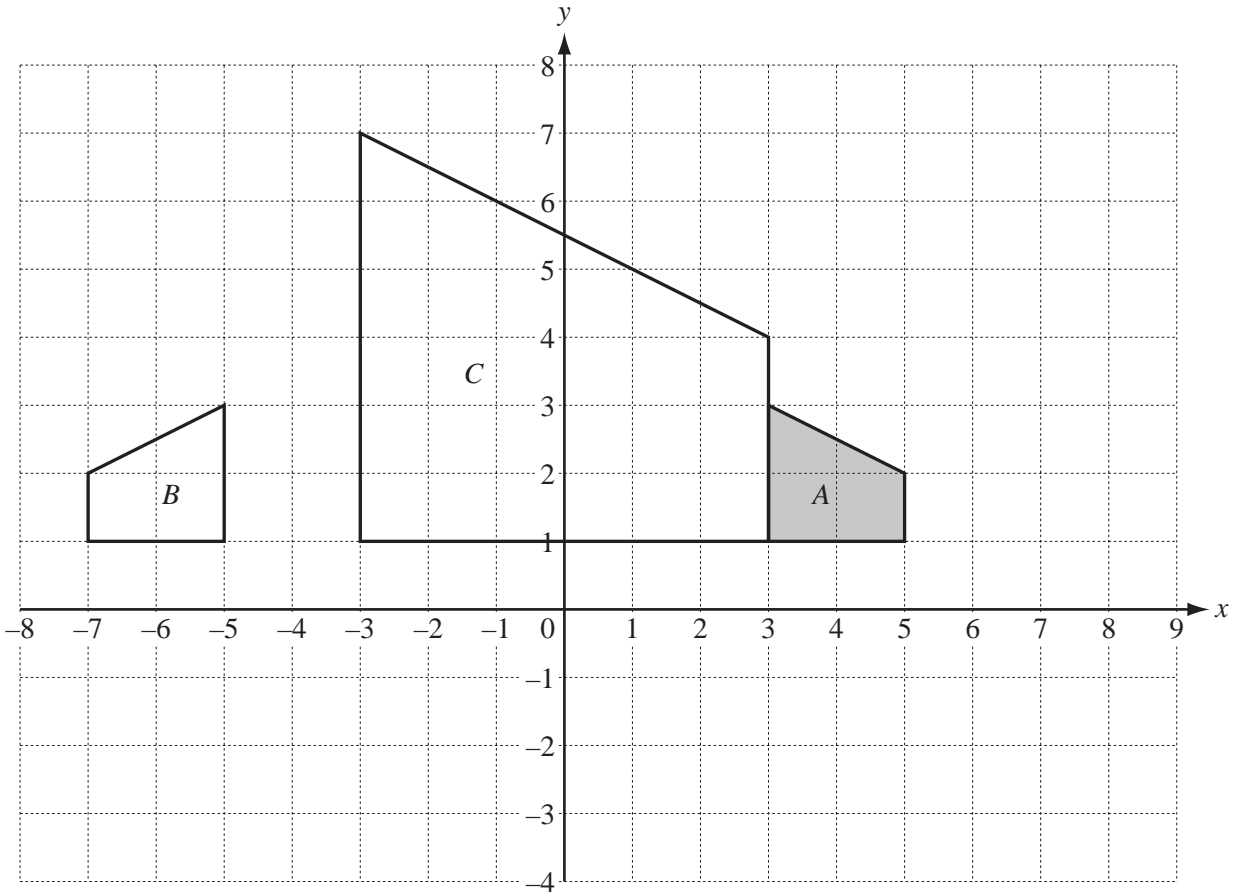
The total distance of Pierre's journey is 11.5 km.

Find the value of  $w$ .

*Answer(c)*  $w =$  ..... [4]

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(a) On the grid, draw the images of the following transformations of **shape A**.

(i) Reflection in the  $x$ -axis [1]

(ii) Translation by the vector  $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$  [2]

(iii) Rotation, centre  $(0, 0)$ , through  $180^\circ$  [2]

(b) Describe fully the **single** transformation that maps

(i) shape  $A$  onto shape  $B$ ,

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

(ii) shape  $A$  onto shape  $C$ .

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

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Diagram 1      Diagram 2      Diagram 3      Diagram 4      Diagram 5

The Diagrams above form a pattern.

(a) Draw Diagram 5 in the space provided. [1]

(b) The table shows the numbers of dots in some of the diagrams.  
Complete the table.

Diagram	1	2	3	4	5		10		$n$
Number of dots	3	5							

[5]

(c) What is the value of  $n$  when the number of dots is 737?

Answer(c) ..... [2]

(d) Complete the table which shows the **total** number of dots in consecutive pairs of diagrams.

For example, the **total** number of dots in Diagram 2 and Diagram 3 is 12.

Diagrams	1 and 2	2 and 3	3 and 4	4 and 5		10 and 11		$n$ and $n + 1$
Total number of dots	8	12	16					

[3]

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