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0580/33

October/November 2011

2 hours

Additional Materials:	Electronic calculator	Geometrical instruments
	Mathematical tables (optional)	Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 104.

This document consists of **16** printed pages.

- 1 Caroline goes to a shop.

The shopping bill shows the items she buys.

Item	Cost (\$)
1 packet of cereal	1.20
3 bottles of water at \$0.45 each	1.35
2 cartons of milk at \$0.82 each	
4 kg of rice at \$0.90 per kg	
0.7 kg of apples at \$2.40 per kg	

- (a) Complete the shopping bill. [3]

- (b) (i) Calculate the total amount of money Caroline spends at the shop.

Answer(b)(i) \$ [1]

- (ii) Caroline pays with a \$10 note.

Calculate how much change she receives.

Answer(b)(ii) \$ [1]

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- (c) Caroline arrived at the shop at 09 48.
She was in the shop for 18 minutes.
She then took 5 minutes to walk to a café.
She was in the café for 20 minutes.

(i) At what time did Caroline leave the café?

Answer(c)(i) [2]

- (ii) Caroline then went to the library.
She was in the library for 45 minutes.

Work out the ratio

time in the shop : time in the library.

Give your answer in its simplest form.

Answer(c)(ii) : [2]

- (d) When Caroline left home she had \$36.50.
She returned home with \$12.74.

Calculate \$12.74 as a percentage of \$36.50.

Answer(d) % [1]

- 2 James takes 12 science tests during one school term.
These are his marks.

18 11 20 15 15 12 15 9 11 15 14 13

(a) Find

(i) the range,

Answer(a)(i) [1]

(ii) the mode,

Answer(a)(ii) [1]

(iii) the median,

Answer(a)(iii) [2]

(iv) the mean.

Answer(a)(iv) [2]

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- (b) James sorts his marks into three levels.
The levels are Satisfactory (less than 12), Good (12 to 16) and Excellent (more than 16).

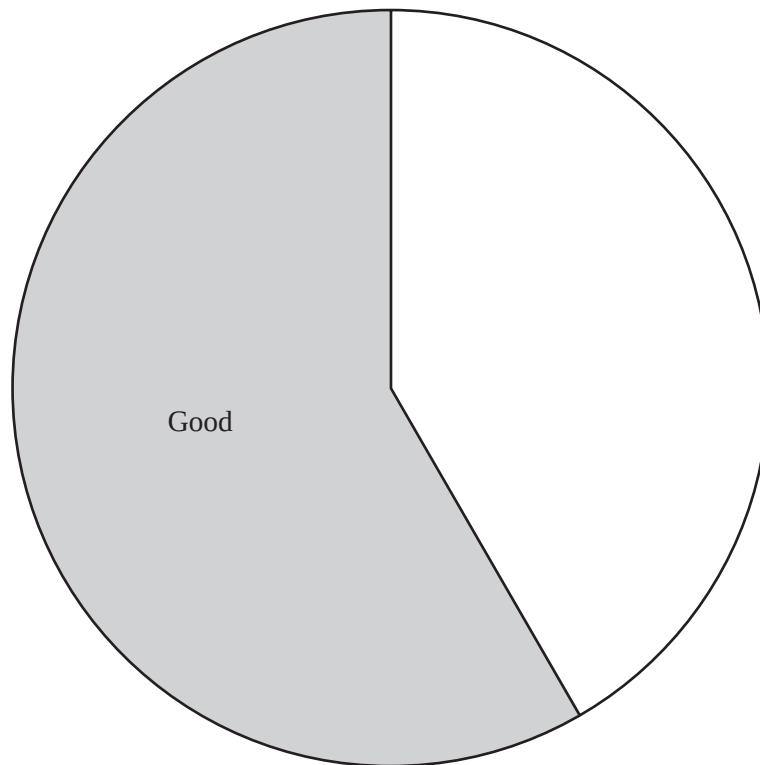
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- (i) Complete the frequency table to show this information.

Level	Satisfactory	Good	Excellent
Frequency		7	

[1]

- (ii) Complete the pie chart accurately and label each sector.

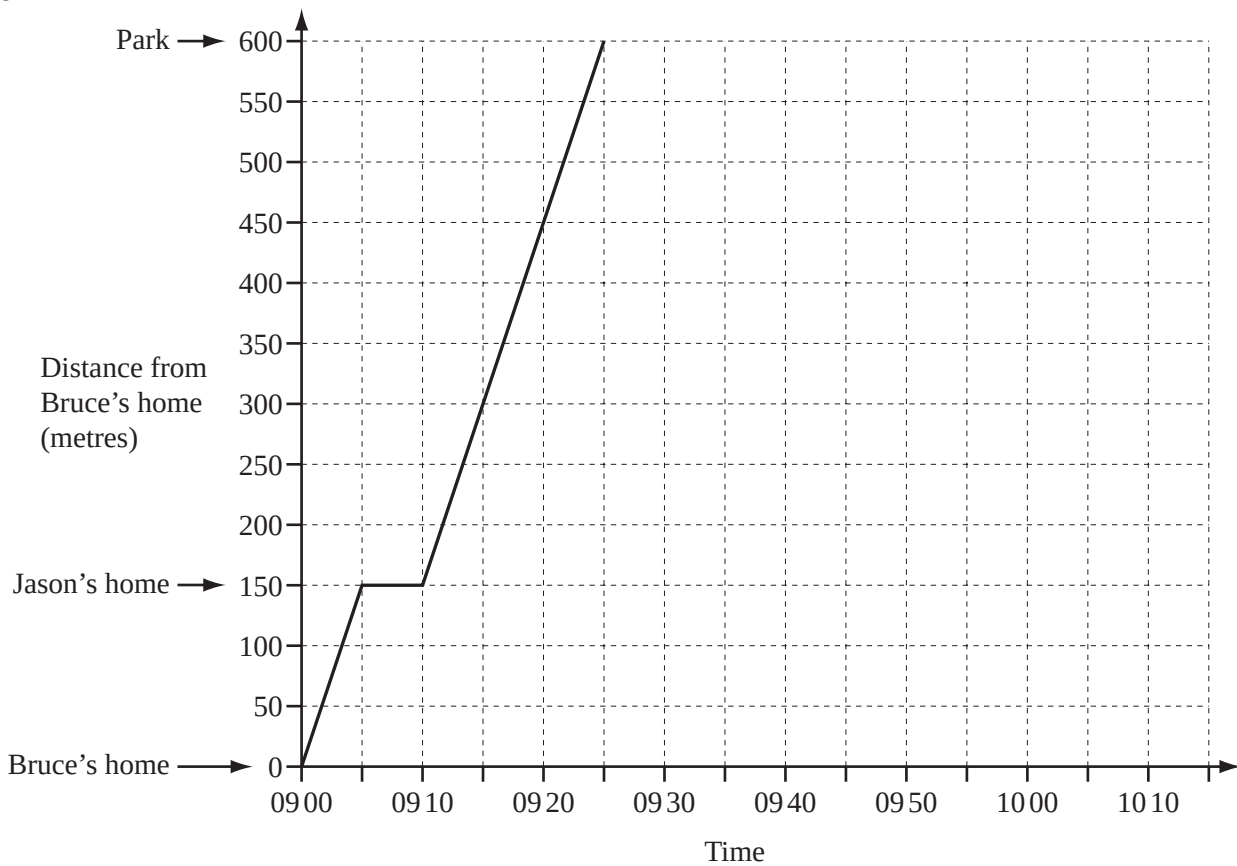


[2]

- (c) What fraction of the marks were Satisfactory or Good?
Give your answer in its lowest terms.

Answer(c) [2]

3

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One morning, Bruce walked from his home to Jason's home and the two boys walked to the park. The distance-time graph shows Bruce's journey.

- (a) How many minutes was Bruce at Jason's home?

Answer(a) min [1]

- (b) How far **from the park** were Bruce and Jason at 09 20?

Answer(b) m [2]

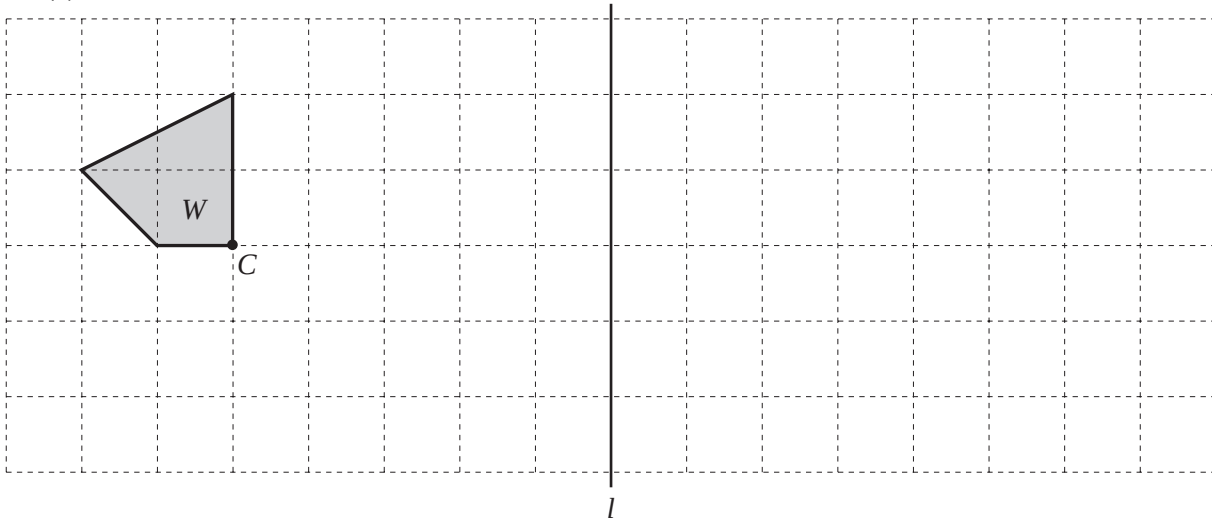
- (c) Work out the speed at which Bruce and Jason walked to the park.
Give your answer in km/h.

Answer(c) km/h [3]

- (d) Bruce stayed at the park for 35 minutes.
He then walked home at a speed of 60 metres per minute.

Complete the graph to show Bruce's time at the park and his journey home. [3]

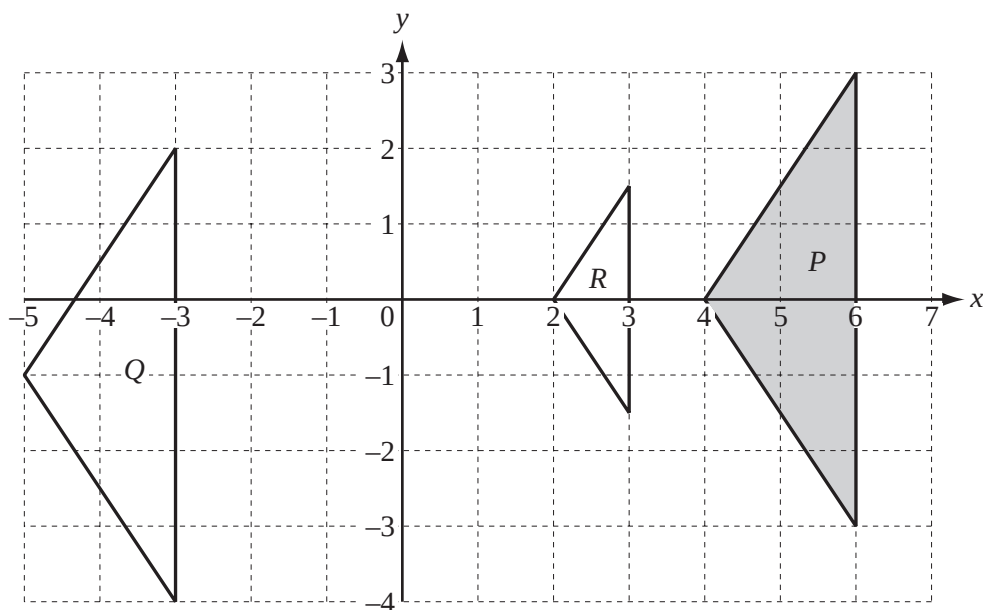
4 (a)



On the grid,

- (i) draw the reflection of W in the line l , [2]
- (ii) rotate W anticlockwise through 90° , about the point C . [2]

(b)



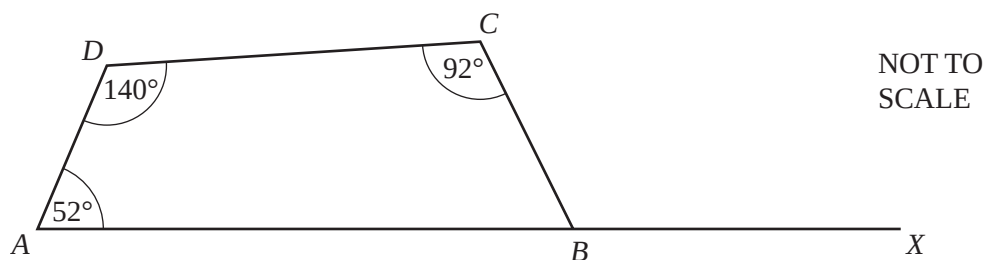
- (i) Describe fully the **single** transformation that maps P onto Q .

Answer(b)(i) [2]

- (ii) Describe fully the **single** transformation that maps P onto R .

Answer(b)(ii) [3]

5 (a)

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In the quadrilateral $ABCD$, angle $BAD = 52^\circ$, angle $ADC = 140^\circ$ and angle $DCB = 92^\circ$.
 AB is extended to X .

- (i) Calculate angle CBX .

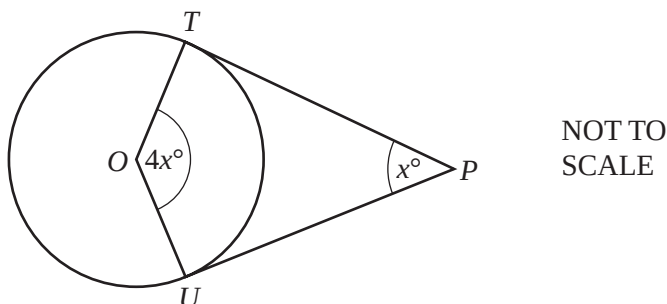
Answer(a)(i) Angle $CBX =$ [2]

- (ii) The line BY bisects angle CBX .
 Complete the statement.

The lines BY and AD are

because [2]

(b)



The diagram shows a circle, centre O .
 PT and PU are tangents to the circle at T and U .
 Angle $TPU = x^\circ$ and angle $TOU = 4x^\circ$.

Calculate the value of x .

Answer(b) $x =$ [3]

- (c) The exterior angle of a regular polygon is 20° .

Calculate the number of sides of the polygon.

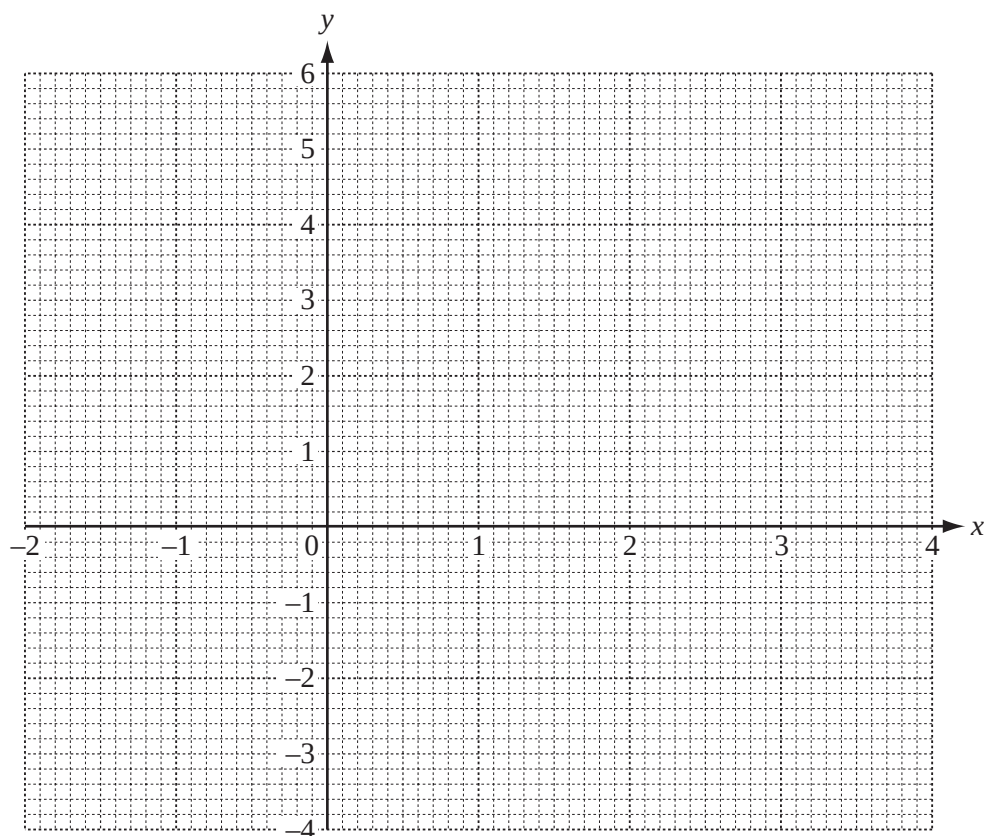
Answer(c) [2]

- 6 (a) Complete the table for $y = 4 + 2x - x^2$.

x	-2	-1	0	1	2	3	4
y		1		5		1	

[2]

- (b) On the grid, draw the graph of $y = 4 + 2x - x^2$ for $-2 \leq x \leq 4$.



[4]

- (c) (i) Draw the line of symmetry of the graph.

[1]

- (ii) Write down the equation of this line of symmetry.

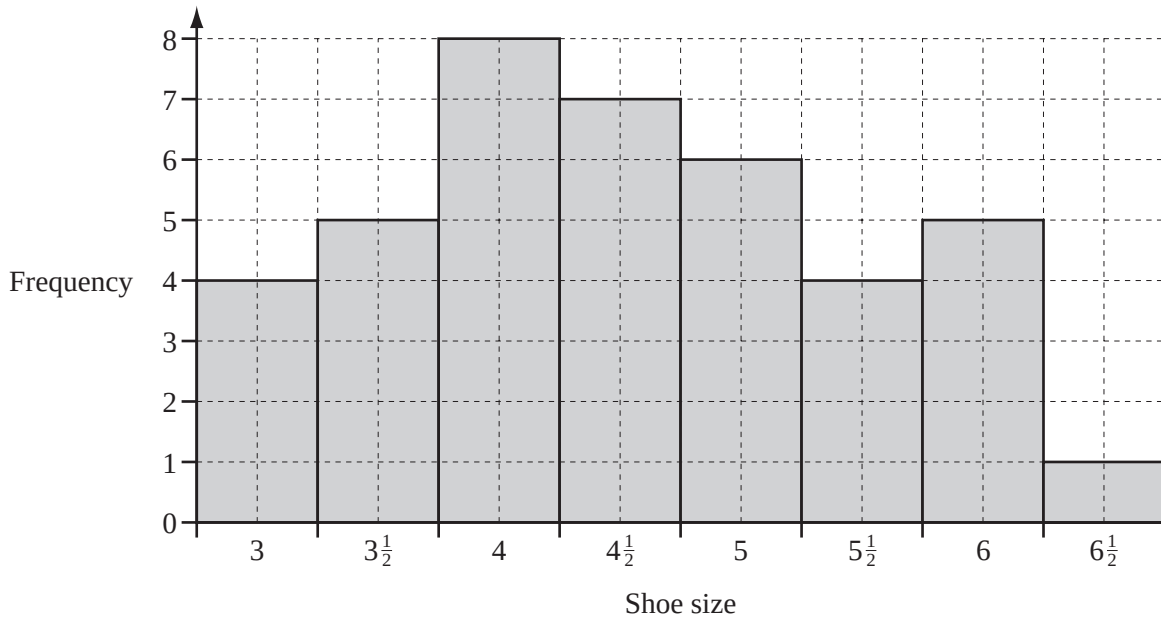
Answer(c)(ii) [1]

- (d) Use your graph to solve the equation $4 + 2x - x^2 = 0$.

Answer(d) $x =$ or $x =$ [2]

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The bar chart shows the frequencies of the shoe sizes for a group of students.

(a) Use the information in the bar chart to complete the frequency table.

Shoe size	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$
Frequency	4							1

[2]

(b) How many students are in the group?

Answer(b) [1]

(c) Calculate the mean shoe size.

Answer(c) [3]



- (a) Construct triangle ABC accurately, with $AC = 10$ cm and $BC = 8$ cm.
The line AB has been drawn for you. [2]

- (b) (i) Using a straight edge and compasses only, construct the bisector of angle A . [2]

- (ii) The bisector of angle A meets BC at X .

Measure the length of BX .

Answer(b)(ii) $BX =$ cm [1]

- (c) (i) Using a straight edge and compasses only, construct the perpendicular bisector of AB . [2]

- (ii) The perpendicular bisector of AB meets AC at Y and AX at Z .

Measure angle CYZ .

Answer(c)(ii) Angle $CYZ =$ [1]

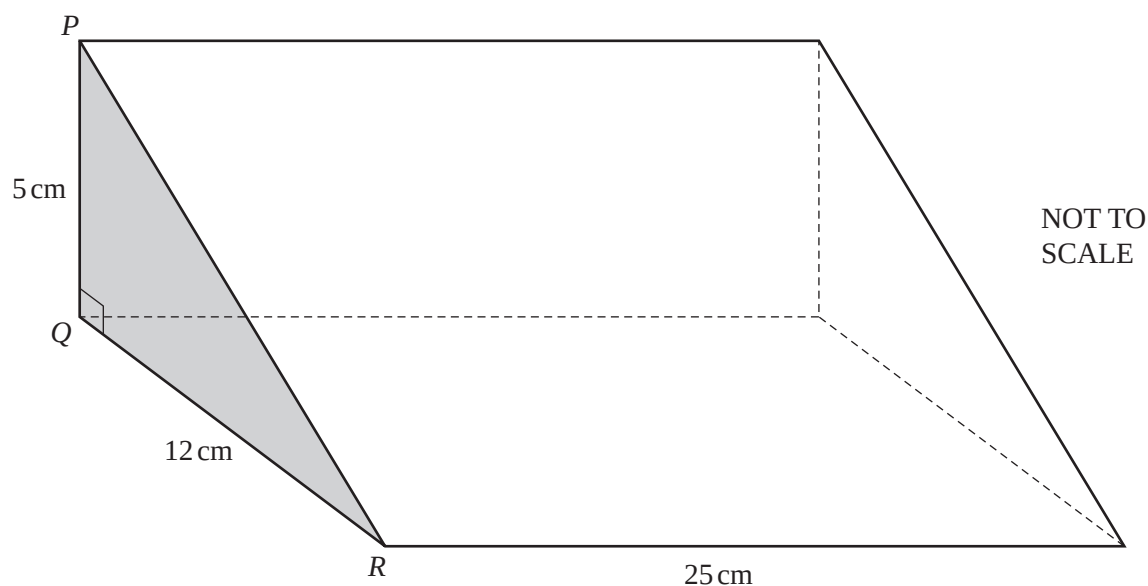
- (d) Shade the region inside triangle ABC which is

and

- nearer to AB than to AC
- nearer to B than to A .

[1]

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The diagram shows a solid triangular prism of length 25 cm .
 The cross-section of the prism is triangle PQR .
 $PQ = 5\text{ cm}$, $QR = 12\text{ cm}$ and angle $PQR = 90^\circ$.

- (a) (i) Calculate the volume of the prism.

Answer(a)(i) cm^3 [3]

- (ii) The prism is made from wood.
 The mass of 1 cm^3 of the wood is 0.96 g .

Calculate the mass of the prism.
 Give your answer in kilograms.

Answer(a)(ii) kg [2]

- (b) (i) Show that $PR = 13$ cm.

Answer(b)(i)

[2]

- (ii) The prism is completely covered with plastic at a cost of \$0.08 per square centimetre.

By finding the total area of the two triangles and the three rectangles, calculate the total cost of the plastic used.

Answer(b)(ii) \$ [4]

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10 (a) Tatiana goes for a walk.

- (i) She walks for 15 minutes at a speed of 80 metres per minute.

Calculate the distance she walks.

Answer(a)(i) m [1]

- (ii) She then walks for a further p minutes at w metres per minute.

Write down an expression, in terms of p and w , for the **total** distance Tatiana walks.

Answer(a)(ii) m [1]

- (iii) Write down an expression, in terms of p and w , for Tatiana's average speed, in metres per minute.

Answer(a)(iii) m/min [2]

(b) The volume, V , of a solid is given by the following formula.

$$V = 3b\left(t + \frac{1}{2}m\right)$$

(i) Find V when $b = 4$, $t = 5$ and $m = 6$.

Answer(b)(i) $V =$ [2]

(ii) Find b when $t = 3$, $m = 2$ and $V = 84$.

Answer(b)(ii) $b =$ [3]

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Question 11 is printed on the next page.

11 (a) Write down the next term in each of the following sequences.

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(i) 8, 15, 22, 29, [1]

(ii) 3, 6, 12, 24, [1]

(iii) 1, 4, 9, 16, [1]

(iv) 0, 3, 8, 15, [1]

(b) Write down an expression, in terms of n , for the n th term of

(i) the sequence in **part(a)(iii)**,

Answer(b)(i) [1]

(ii) the sequence in **part(a)(iv)**.

Answer(b)(ii) [1]

(c) The n th term of a sequence is $7n - 3$.

(i) Write down the value of the 4th term.

Answer(c)(i) [1]

(ii) Which term has a value of 592?

Answer(c)(ii) [2]

(d) 1, 2, 2, 4, 8, 32, 256,

Work out the next two terms of this sequence.

Answer(d) , [2]

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