

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**J512/01**

**MATHEMATICS SYLLABUS A**

**Paper 1 (Foundation Tier)**

**MONDAY 6 JUNE 2011: Afternoon**

**DURATION: 2 hours**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the question paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**

**Tracing paper (optional)**

<p><b><u>WARNING</u></b> <b>No calculator can be used for this paper.</b></p>
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**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

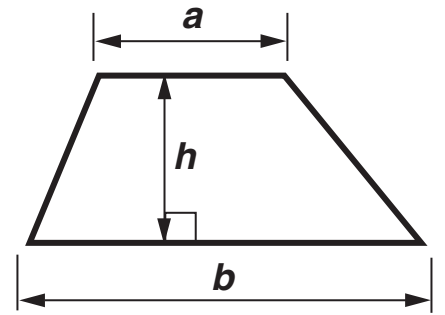
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).**
- **Answer ALL the questions.**

## **INFORMATION FOR CANDIDATES**

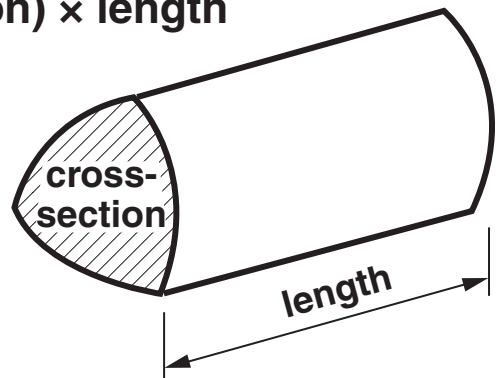
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this paper is 100.**

# FORMULAE SHEET: FOUNDATION TIER

Area of trapezium =  $\frac{1}{2}(a + b)h$




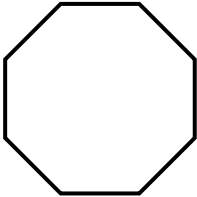
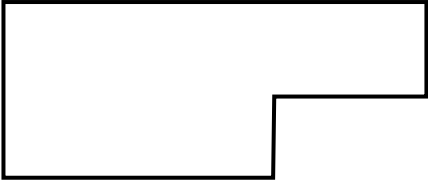
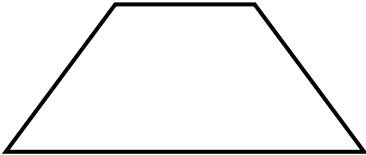
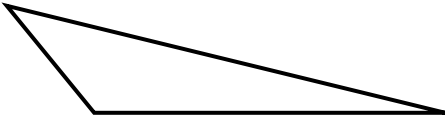
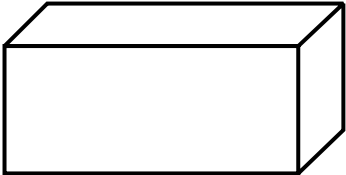
Volume of prism = (area of cross-section)  $\times$  length



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1 For each of these shapes three possible names are given.

Put a tick (✓) beside the correct mathematical name.  
The first one has been done for you.

	square circle rectangle ✓
	octagon decagon hexagon
	octagon pentagon hexagon
	trapezium rhombus arrowhead
	isosceles triangle equilateral triangle scalene triangle
	cube cuboid cone

[5]

- 2 Carlos did a survey to find out what fruit people liked. Some of his results are shown in the table.

Fruit	Tally	Frequency
Strawberry		3
Orange		
Apple		
Pear		7
Mango		

(a) Complete the four spaces in the table. [2]

(b) Which fruit was the most popular?

(b) \_\_\_\_\_ [1]

(c) How many more people liked mango than strawberry?

\_\_\_\_\_

(c) \_\_\_\_\_ [1]

**Carlos asked 50 people in his survey.**

**Twelve people did not answer, some people gave the name of one fruit and all the rest gave the names of two fruits.**

**(d) How many people gave the names of two fruits?**

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**(d) \_\_\_\_\_ [3]**

**3 Work out.**

**(a)  $166 + 383$**

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**(a)** \_\_\_\_\_ **[1]**

**(b)  $707 - 123$**

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**(b)** \_\_\_\_\_ **[1]**

**(c)  $144 \div 8$**

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**(c)** \_\_\_\_\_ **[1]**



**(d)  $46 \times 27$**

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**(d) \_\_\_\_\_ [3]**

- 4 (a) Put a ring round each of the two fractions that are equivalent to  $\frac{1}{4}$ .

$\frac{21}{24}$        $\frac{3}{12}$        $\frac{21}{84}$        $\frac{4}{7}$       [2]

- (b) Put a ring round each of the two terms that are equivalent to 0.75.

75%      7.5%       $\frac{5}{7}$        $\frac{3}{4}$        $\frac{75}{10}$       [2]

- (c) Put a ring round each of the two terms that are equivalent to 30%.

0.03      0.3       $\frac{1}{3}$        $\frac{15}{20}$        $\frac{3}{10}$       [2]

**5 (a) The first three even numbers are 2, 4 and 6.**

**Write down the next two even numbers.**

**(a)** \_\_\_\_\_ [1]

**(b) 17 is an odd number.**

**Write down the odd numbers that come immediately before and immediately after 17.**

\_\_\_\_\_ [2]

- 6 A recipe book gives this rule to find the cooking time for a leg of lamb.

<b>cooking time in minutes</b>	<b>=</b>	<b>30 × weight in pounds</b>	<b>+</b>	<b>30</b>
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- (a) Dave is cooking a leg of lamb.  
It weighs 4 pounds.

Work out the cooking time in minutes.

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(a) \_\_\_\_\_ minutes [2]

**(b) Ann is cooking a larger leg of lamb.**

**It weighs  $8\frac{1}{2}$  pounds.**

**Work out the cooking time.**

**Give your answer in hours and minutes.**

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**(b) \_\_\_\_\_ hours \_\_\_\_\_ minutes [3]**

- 7 Jo keeps the paper for her printer in an open-top box. Its base is a rectangle and its height is 8 cm.



- (a) Use the centimetre grid opposite to draw a net of this box. [3]  
USE A SCALE OF 1 cm TO REPRESENT 4 cm.

- (b) Jo has 400 sheets of paper.

- (i) 15% of the sheets are yellow.

Work out how many yellow sheets Jo has.

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(b)(i) \_\_\_\_\_ [2]

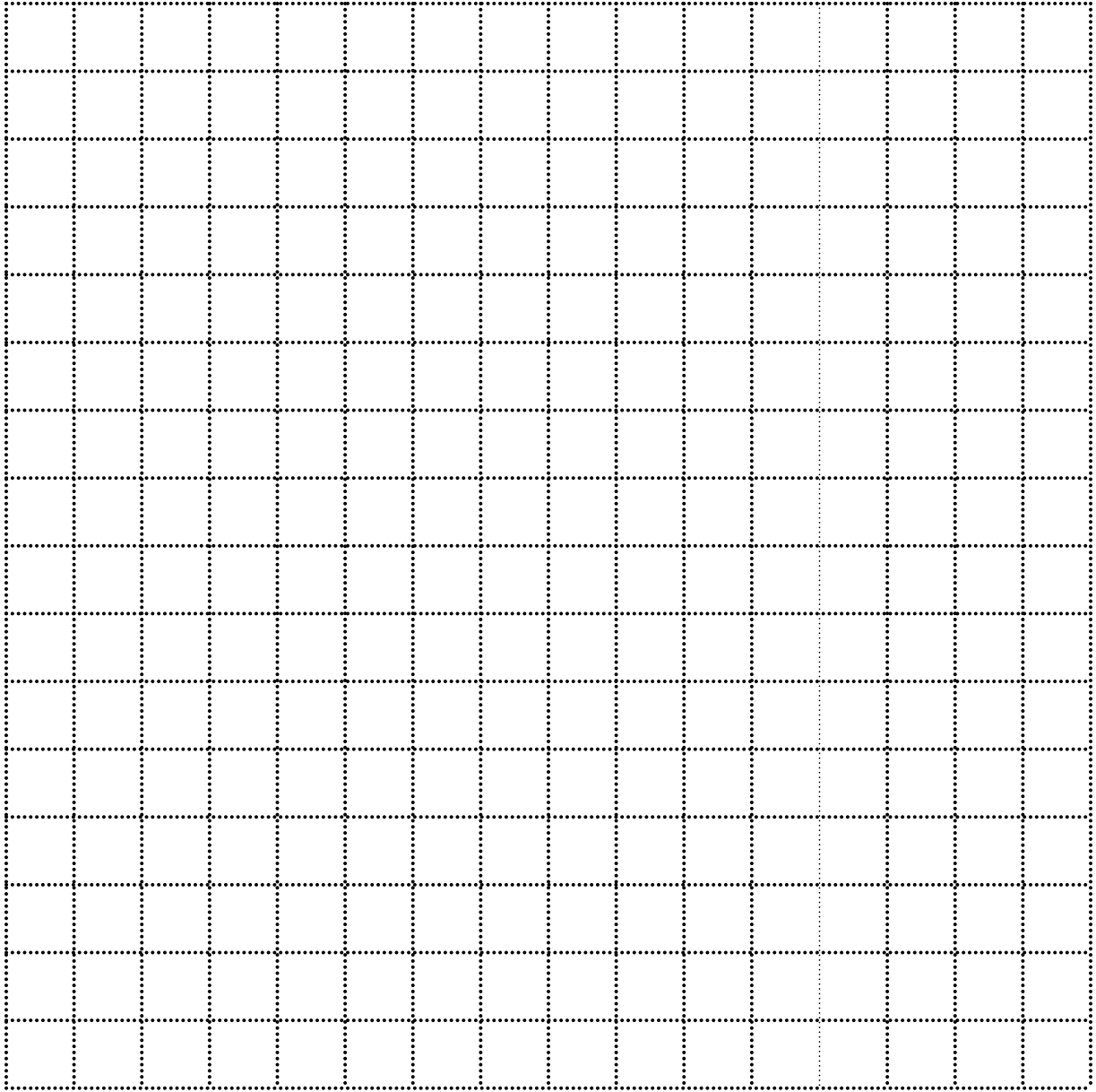
- (ii) Each sheet of Jo's paper is 0.08 mm thick.

What is the height of her pile of 400 sheets?

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(ii) \_\_\_\_\_ mm [2]



**8 Sam and Lizzie are playing a game in their garden.**

**On each turn they throw five rings and count how many they get over a peg.**

**(a) Lizzie plays ten times.  
Here are her scores.**

**0    0    0    0    1    1    2    2    3    5**

**(i) What is the median of Lizzie's scores?**

\_\_\_\_\_

**(a)(i) \_\_\_\_\_ [1]**

**(ii) Lizzie plays for an eleventh time.**

**Explain why the median of her scores will not change.**

\_\_\_\_\_

\_\_\_\_\_ **[1]**



**(b) Sam plays ten times.  
Here are his scores.**

**1    1    2    2    2    3    3    4    5    5**

**(i) Work out the mean of Sam's scores.**

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**(b)(i) \_\_\_\_\_ [3]**

**Sam plays for an eleventh time.**

**(ii) What is the largest amount by which he can improve his mean score?**

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**(ii) \_\_\_\_\_ [3]**

9 (a) What is the square of 1?

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(a) \_\_\_\_\_ [1]

(b) Work out.

(i)  $2^3 + \sqrt{9}$

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(b)(i) \_\_\_\_\_ [2]

(ii)  $\sqrt[3]{125}$

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(ii) \_\_\_\_\_ [1]

(iii)  $0.8 \times 0.5$

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(iii) \_\_\_\_\_ [1]

**(c) (i) Ken thinks that 21 is a prime number.**

**Give a reason why he is wrong.**

\_\_\_\_\_  
\_\_\_\_\_ [1]

**(ii) Write down the next prime number AFTER 13.**

\_\_\_\_\_  
**(c)(ii)** \_\_\_\_\_ [1]

**10 Here is part of the train timetable for the Esk Valley railway line in Yorkshire.**

**WHITBY TO MIDDLESBROUGH**

<b>Whitby</b>	–	–	–	<b>0852</b>	–	<b>1241</b>
<b>Grosmont</b>	–	–	–	<b>0909</b>	–	<b>1258</b>
<b>Danby</b>	–	–	–	<b>0930</b>	–	<b>1319</b>
<b>Battersby</b>	–	–	–	<b>0953</b>	–	<b>1342</b>
<b>Nunthorpe</b>	<b>0719</b>	<b>0830</b>	<b>0916</b>	<b>1005</b>	<b>1216</b>	<b>1354</b>
<b>Middlesbrough</b>	<b>0729</b>	<b>0843</b>	<b>0929</b>	<b>1018</b>	<b>1228</b>	<b>1407</b>

**MIDDLESBROUGH TO WHITBY**

<b>Middlesbrough</b>	<b>1449</b>	<b>1647</b>	<b>1740</b>	<b>1754</b>	<b>1949</b>	<b>2044</b>
<b>Nunthorpe</b>	<b>1503</b>	<b>1659</b>	<b>1751</b>	<b>1808</b>	<b>2003</b>	<b>2055</b>
<b>Battersby</b>	–	–	<b>1803</b>	–	–	<b>2111</b>
<b>Danby</b>	–	–	<b>1825</b>	–	–	<b>2129</b>
<b>Grosmont</b>	–	–	<b>1846</b>	–	–	<b>2150</b>
<b>Whitby</b>	–	–	<b>1907</b>	–	–	<b>2211</b>

**Malcolm catches the 0852 from Whitby to Middlesbrough.**

**When he returns from Middlesbrough he catches the 1754 to Nunthorpe where he meets a friend.**

**He then catches the next train from Nunthorpe to Whitby.**

**How many minutes does he spend altogether on these three train journeys?**

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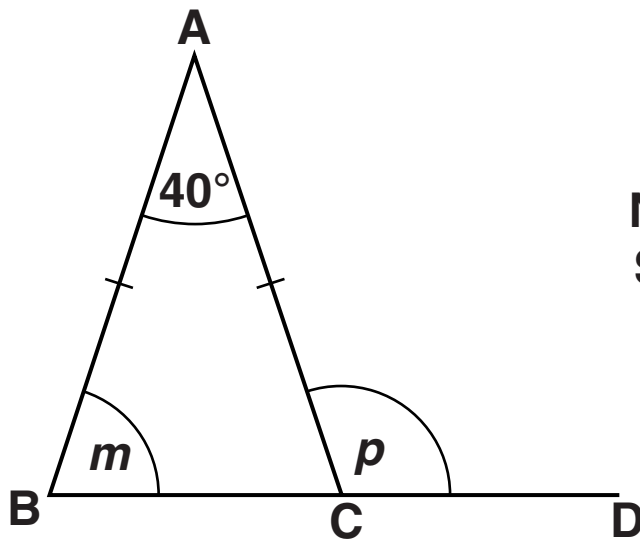
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\_\_\_\_\_ minutes [3]

- 11 Triangle ABC is isosceles with angle A =  $40^\circ$ .  
BCD is a straight line.



NOT TO  
SCALE

- (a) Calculate the size of angle  $m$ .

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(a) \_\_\_\_\_  $^\circ$  [2]

- (b) Calculate the size of angle  $p$ .  
Give a reason for your answer.

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$p =$  \_\_\_\_\_  $^\circ$  because \_\_\_\_\_

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[2]

**12 This stem and leaf diagram shows the heights in centimetres of some cactus plants. The shortest plant is 2.3 cm high.**



**Key: \_\_\_\_\_ | \_\_\_\_\_ represents \_\_\_\_\_ cm**

**(a) Complete the key. [1]**

**(b) Another cactus plant is 3.8 cm high.**

**Add this height to the stem and leaf diagram. [1]**

**The diagram is now complete.**

**(c) How many plants are now represented in the diagram?**

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**(c)** \_\_\_\_\_ **[1]**

**(d) What is the range of the heights of the plants?**

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**(d)** \_\_\_\_\_ **cm [1]**

**(e) What is the modal height?**

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**(e)** \_\_\_\_\_ **cm [1]**



**13 (a) Solve.**

**(i)  $10x = 420$**

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**(a)(i) \_\_\_\_\_ [1]**

**(ii)  $y - 7 = 29$**

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**(ii) \_\_\_\_\_ [1]**

**(b) Simplify.**

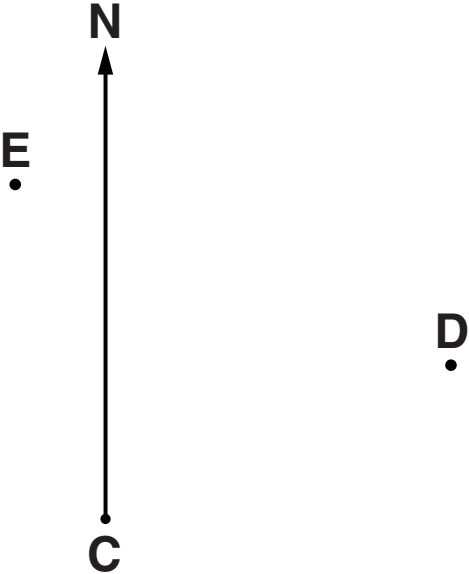
**$t \times t \times t \times t \times t$**

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**(b) \_\_\_\_\_ [1]**

14 This diagram shows three towns C, D and E.

The scale is 1 cm represents 20 miles.



**Complete these sentences.**

**(a) The bearing of town D from town C is**

\_\_\_\_\_°.

**[1]**

**(b) The bearing of town E from town C is**

\_\_\_\_\_°.

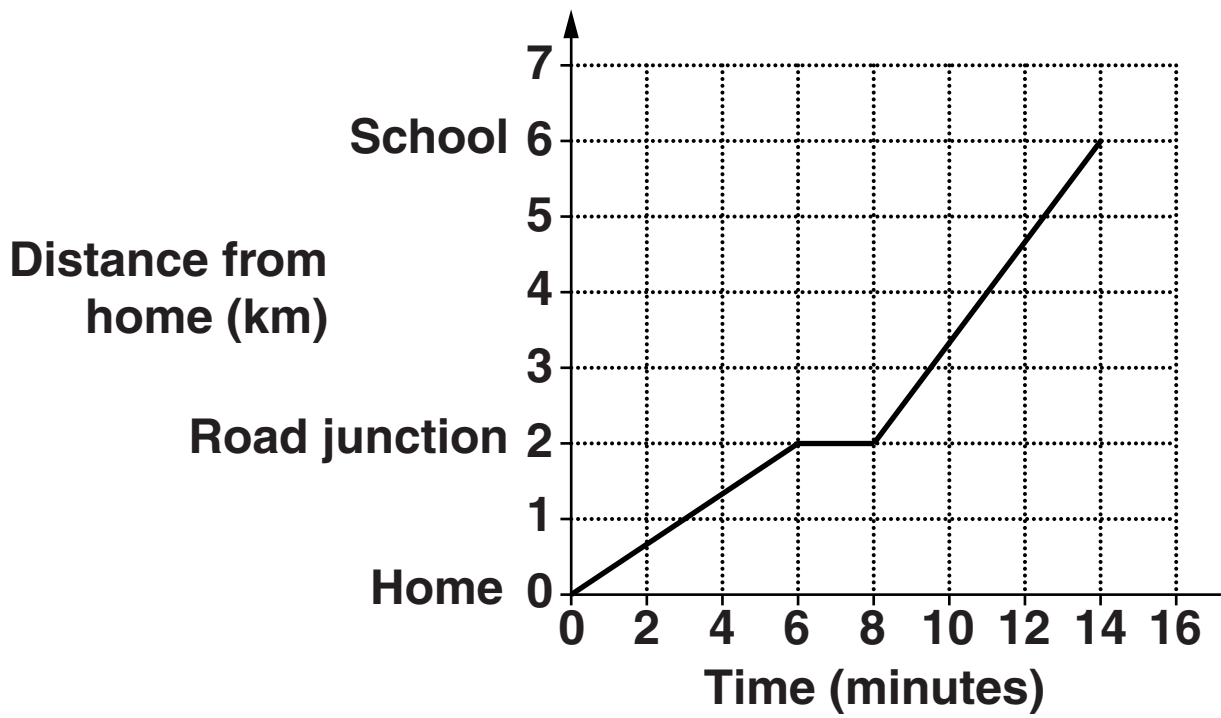
**[1]**

**(c) The distance from town D to town E is**

\_\_\_\_\_ miles.

**[2]**

15 Laura's mum drove her to school one morning.  
The graph represents their journey.



**Complete this description of their journey from home to school.**

**From home to the road junction they travelled at a constant speed of \_\_\_\_\_ km/h.**

**When they reached the road junction they \_\_\_\_\_ for \_\_\_\_\_ minutes.**

**After the road junction they travelled at a \_\_\_\_\_ speed of \_\_\_\_\_ km/h until they reached school.**

**[6]**

**16 Solve.**

**(a)  $\frac{x}{2} = 8$**

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**(a) \_\_\_\_\_ [1]**

**(b)  $3(2x - 5) = 30$**

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**(b) \_\_\_\_\_ [3]**

- 17 (a) Tom had £50.  
He bought a bike for £46.

What percentage of the £50 did Tom spend on the bike?

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(a) \_\_\_\_\_ % [2]

- (b) A company makes pork pies in two sizes.  
The smaller pork pies each weigh 820 g.  
The larger pork pies weigh  $17\frac{1}{2}\%$  more than the smaller ones.

Work out the weight of one of the larger pork pies.

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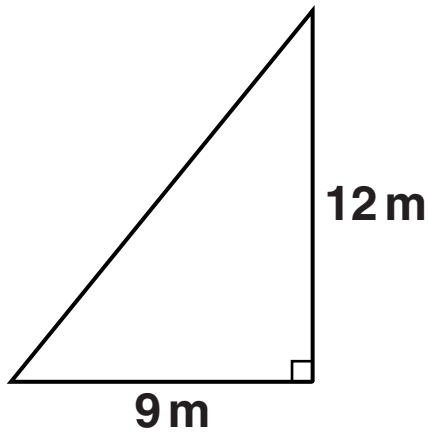
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(b) \_\_\_\_\_ g [3]

**18 Use the triangle below to answer the questions that follow.**



**NOT TO SCALE**

**(a) (i) Work out the area of this triangle.**

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**(a)(i) \_\_\_\_\_ m<sup>2</sup> [2]**

**(ii) Change your answer to part (a)(i) to an area in cm<sup>2</sup>.**

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**(ii) \_\_\_\_\_ cm<sup>2</sup> [1]**



**(b) Work out the length of the hypotenuse of the triangle.**

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**(b) \_\_\_\_\_ m [3]**

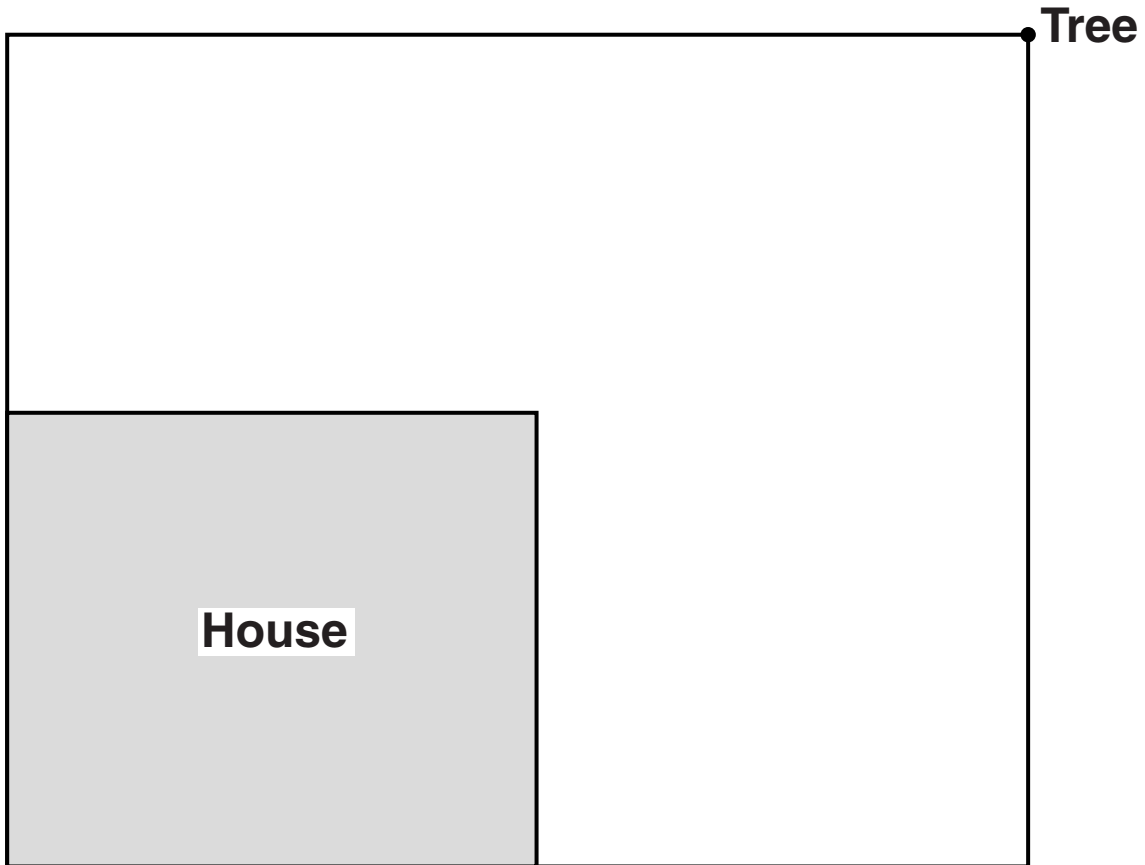
**TURN OVER FOR QUESTION 19**

**19 Use ruler and compasses in this question.**

**The diagram is a scale drawing of a house and its garden.**

**There is a tree in one corner of the garden.**

**The scale is 1 cm represents 2 m.**



**A second tree is to be planted in the garden.**

**It must be**

- **more than 8 m from the house,**
- **more than 12 m from the first tree.**

**On the diagram construct accurately and shade the regions where the second tree can be planted. [6]**

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