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Total Mark

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NATIONAL QUALIFICATIONS 2013

# MATHEMATICS INTERMEDIATE 1

Units 1, 2 and  
Applications of Mathematics  
Paper 1 (Non-calculator)



## X101/10/01

WEDNESDAY, 22 MAY 9.00 AM – 9.35 AM

Fill in these boxes and read what is printed below.

Full name of centre

Town

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Forename(s)

Surname

Number of seat

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Date of birth

Day

Month

Year

Scottish candidate number

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- 1 You may **NOT** use a calculator.
- 2 Write your working and answers in the spaces provided. Additional space is provided at the end of this question-answer book for use if required. If you use this space, write clearly the number of the question involved.
- 3 Full credit will be given only where the solution contains appropriate working.
- 4 Before leaving the examination room you must give this book to the Invigilator. If you do not you may lose all the marks for this paper.

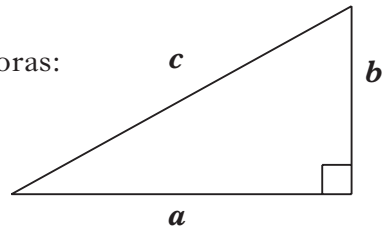
Use blue or black ink. Pencil may be used for graphs and diagrams only.



## FORMULAE LIST

Circumference of a circle:  $C = \pi d$   
Area of a circle:  $A = \pi r^2$   
Curved surface area of a cylinder:  $A = 2\pi r h$

Theorem of Pythagoras:



$$a^2 + b^2 = c^2$$



Marks

All questions should be attempted.

1. (a) Find  $16 \cdot 7 + 5 \cdot 83$ .

1

(b) Find  $9 \times 2 \cdot 13$ .

1

(c) Find 70% of 340.

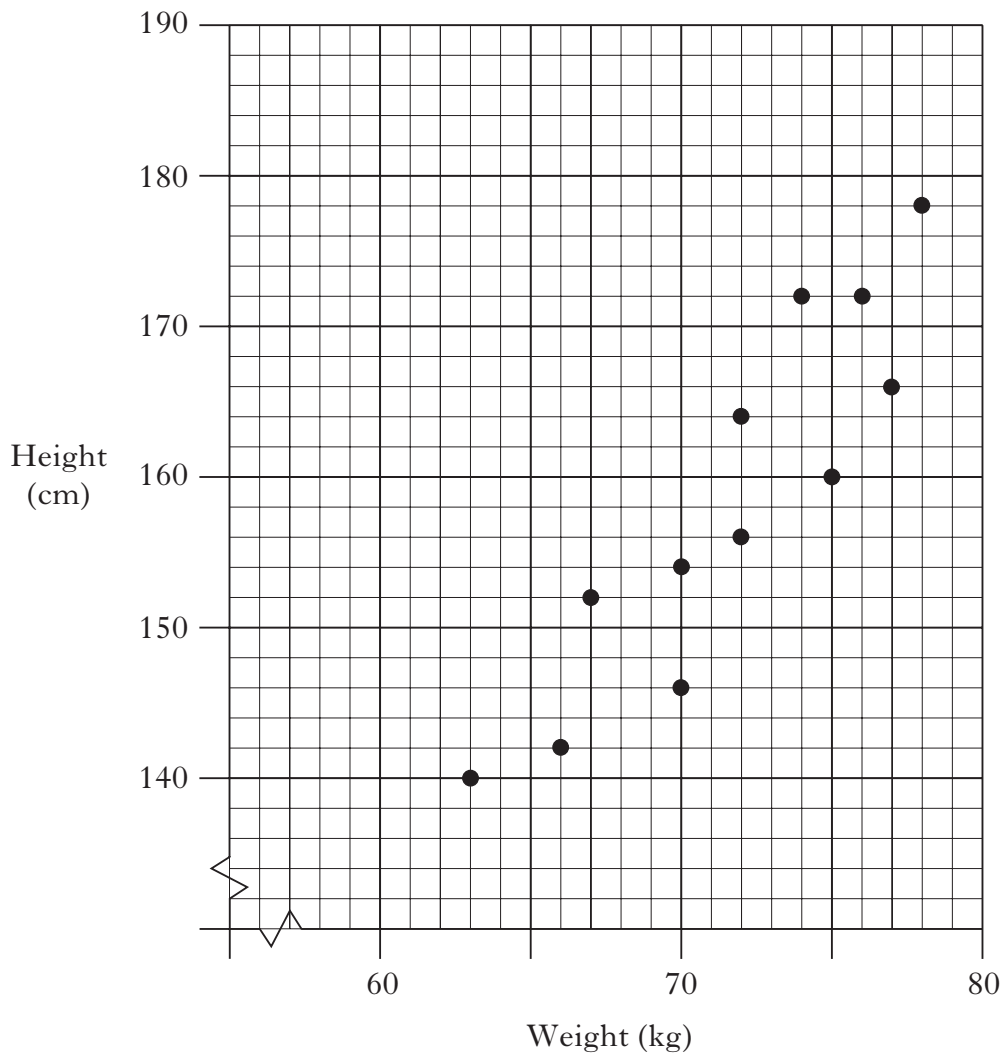
1

[Turn over



Marks

2. The scattergraph shows the weights and heights of a group of teenagers.



- (a) Draw a line of best fit through the points on the graph.

1

- (b) Use your line of best fit to estimate the height of a teenager whose weight is 80 kilograms.

1



Marks

3. Anna's basic rate of pay is £8.60 per hour for a 35 hour week.  
Her overtime rate of pay is time and a half.  
Complete her payslip for a week in which she works 3 hours overtime.

Payments				Deductions	
	Hours	Rate	Amount		Amount
Basic	35	£8.60	£301.00	Tax	£39.40
Overtime	3			National Insurance	£23.88
			<b>Gross Pay</b>	<b>Total Deductions</b>	£63.28
				<b>Net Pay</b>	

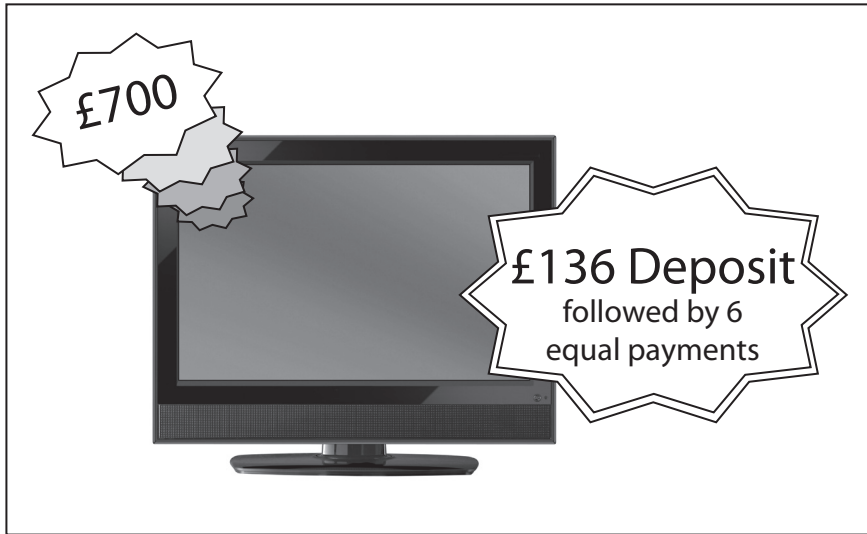
3

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Marks

4. The hire purchase price of this television is £700.



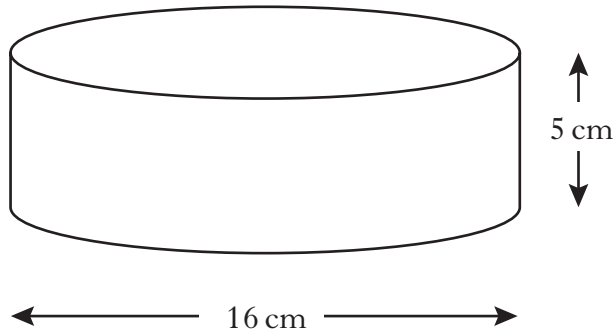
How much will each payment be?

3



Marks

5. A cylinder has diameter 16 centimetres and height 5 centimetres.



Calculate the **curved** surface area of the cylinder.

Use  $\pi = 3.14$ .

3

[Turn over



Marks

6. Fifty students completed a fitness test known as a “Beep Test”.  
The fitness levels they achieved are shown in the frequency table below.

Fitness Level	Number of Students	Fitness Level $\times$ Number of Students
5	4	20
6	5	30
7	9	63
8	21	
9	6	
10	5	
	Total = 50	Total =

- (a) Complete the table above.
- (b) Find the mean fitness level achieved by these students.

1

2





Marks

7. A bag contains 8 blue marbles, 5 red marbles and 2 yellow marbles.

(a) A marble is taken from the bag.

What is the probability that the marble is yellow?

1

(b) This marble is put back in the bag.

One red marble and one blue marble are then removed.

What is the probability that the next marble taken from the bag is blue?

2

[Turn over



Marks

8. Two trains run from Glasgow to London.  
They both have the same journey time.

	1st Train	2nd Train
<b>Glasgow</b> depart	1650	2215
<b>London</b> arrive	2125	

What time does the 2nd train arrive in London?

3

9. Evaluate  $2gh - w$  when  $g = -10$ ,  $h = 4$  and  $w = -30$ .

3



Marks

10. (a) Before he went on holiday to Australia, Jack changed £2000 into Australian dollars.

The exchange rate was £1 = AU\$1.58.

How many Australian dollars did Jack receive for £2000?

2

- (b) While in Australia he changed a further £400 into Australian dollars.

He received AU\$620.

What was the new exchange rate?

2

[END OF QUESTION PAPER]



ADDITIONAL SPACE FOR ANSWERS

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Total Mark

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NATIONAL QUALIFICATIONS 2013

# MATHEMATICS INTERMEDIATE 1

Units 1, 2 and  
Applications of Mathematics  
Paper 2



## X101/10/02

WEDNESDAY, 22 MAY 9.55 AM – 10.50 AM

Fill in these boxes and read what is printed below.

Full name of centre

Town

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Forename(s)

Surname

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Date of birth

Day

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Year

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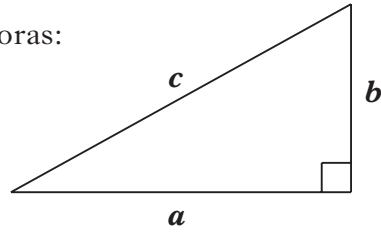
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*Marks*

1. On the “PayforGold” website, the price paid for gold is proportional to its weight.

Colleen sells a matching gold bracelet and necklace on this website.

She is paid £95 for the 20 gram bracelet.

How much is she paid for the 24 gram necklace?

2

**[Turn over**



Marks

2. Frank recorded the number of calories that he consumed last week in the spreadsheet below.

	A	B	C	D	E	F
1		Breakfast	Lunch	Dinner	Snacks	Total Calories
2	Mon	400	600	850	400	
3	Tue	400	600	900	400	
4	Wed	400	650	850	350	
5	Thu	350	600	950	450	
6	Fri	350	650	1000	400	
7	Sat	450	600	1200	250	
8	Sun	550	500	1150	200	
9						

- (a) The result of the formula =SUM(B2..E2) is to be entered in cell F2. What number would appear in cell F2?

1

- (b) Frank wants to enter the average number of calories consumed in snacks during last week in cell E9.

What **formula** should he use?

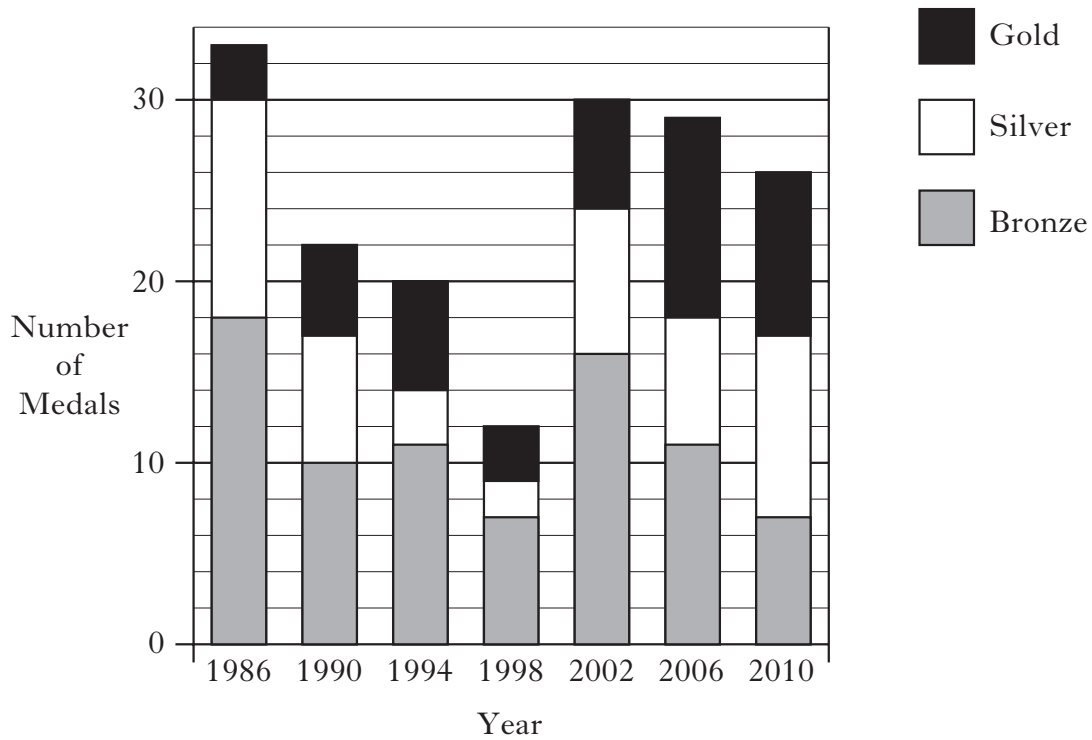
1





Marks

3. The bar graph shows the number of medals won by Scotland at the Commonwealth Games since 1986.



(a) In which year were most **gold** medals won by Scotland?

1

(b) How many **silver** medals did Scotland win in 1990?

1

[Turn over



Marks

4. The table below shows the **monthly payments** to be made when money is borrowed from a finance company.

Borrowers can choose to make payments with or without payment protection.

Loan Amount	Term (Months)	Monthly Payment	
		Without Payment Protection	With Payment Protection
£3000	36	99.58	102.08
£3000	48	80.00	81.88
£3000	180	68.75	70.25
£10 000	36	327.78	336.11
£10 000	48	262.67	268.92
£10 000	180	219.17	224.79
£50 000	60	1083.33	1108.33
£50 000	120	672.92	685.42
£50 000	180	538.19	546.53

(a) Brad borrows £10 000 over 4 years **with payment protection**.  
State his monthly payment.

1

(b) Over the 4 years, how much would Brad save **in total** if he repaid the loan without payment protection?

2



*Marks*

5. Chris took part in a track cycling competition.  
He completed 6 laps of a 500 metre track.  
This took him 4 minutes.  
Find his average speed in **metres per second**.

3

[Turn over

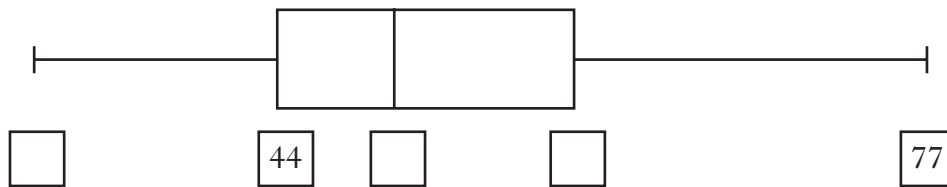


Marks

6. The number of miles that a sample of 13 new cars can travel on one gallon of petrol is listed below.

44 41 44 55 47 77 48 53 50 32 70 62 56

Complete the boxplot, drawn below, to show this information.



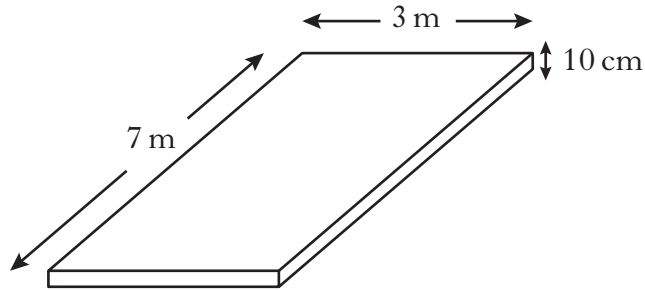
4



Marks

7. Bob is building a patio with a concrete base.

The base of the patio is 7 metres long, 3 metres wide and 10 centimetres deep.



Concrete costs £60 **per cubic metre**.

Find the total cost of the concrete for the base of Bob's patio.

3

[Turn over



Marks

8. John and Steven are playing snooker. They play eight games.  
Shown below are the number of points John scored in each game.

21    39    22    53    45    19    43    46

(a) Find the median.

(b) Find the range.

(c) The median number of points Steven scored is 23 and the range is 15.

Make **two** comments comparing the number of points scored by Steven and John.

2

1

2

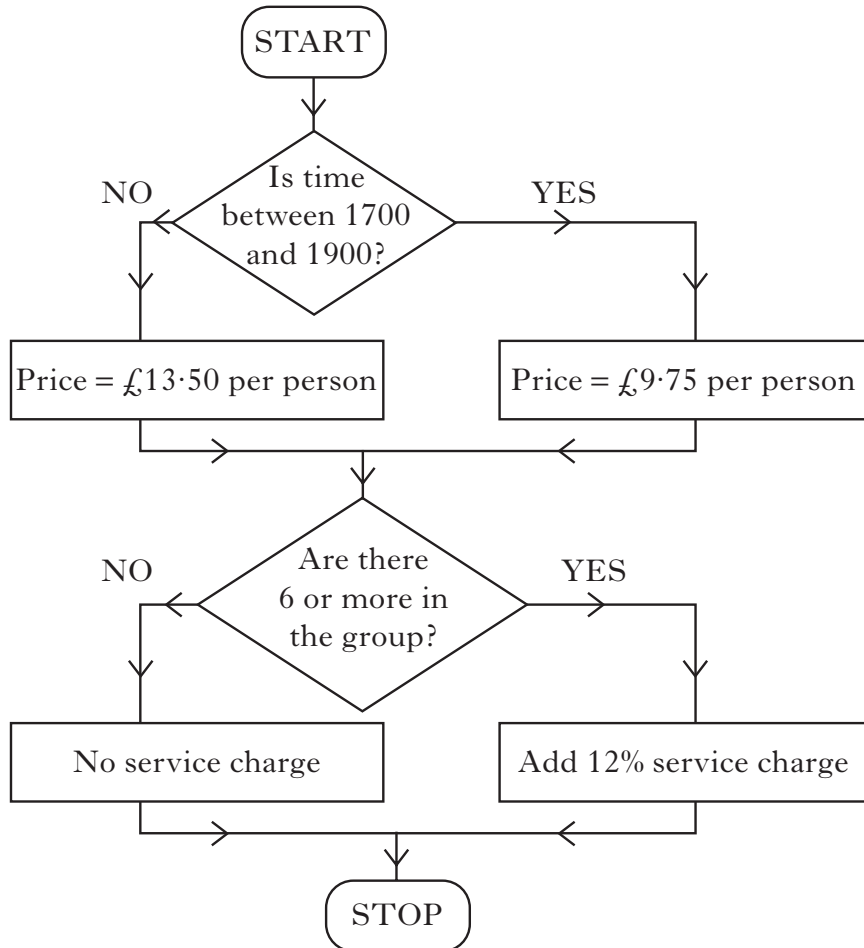


Marks

9. A group of six people reserve a table in a restaurant for a fixed price meal.

They reserve a table for 6.30 pm.

This flowchart is used to work out the total cost of the meal.

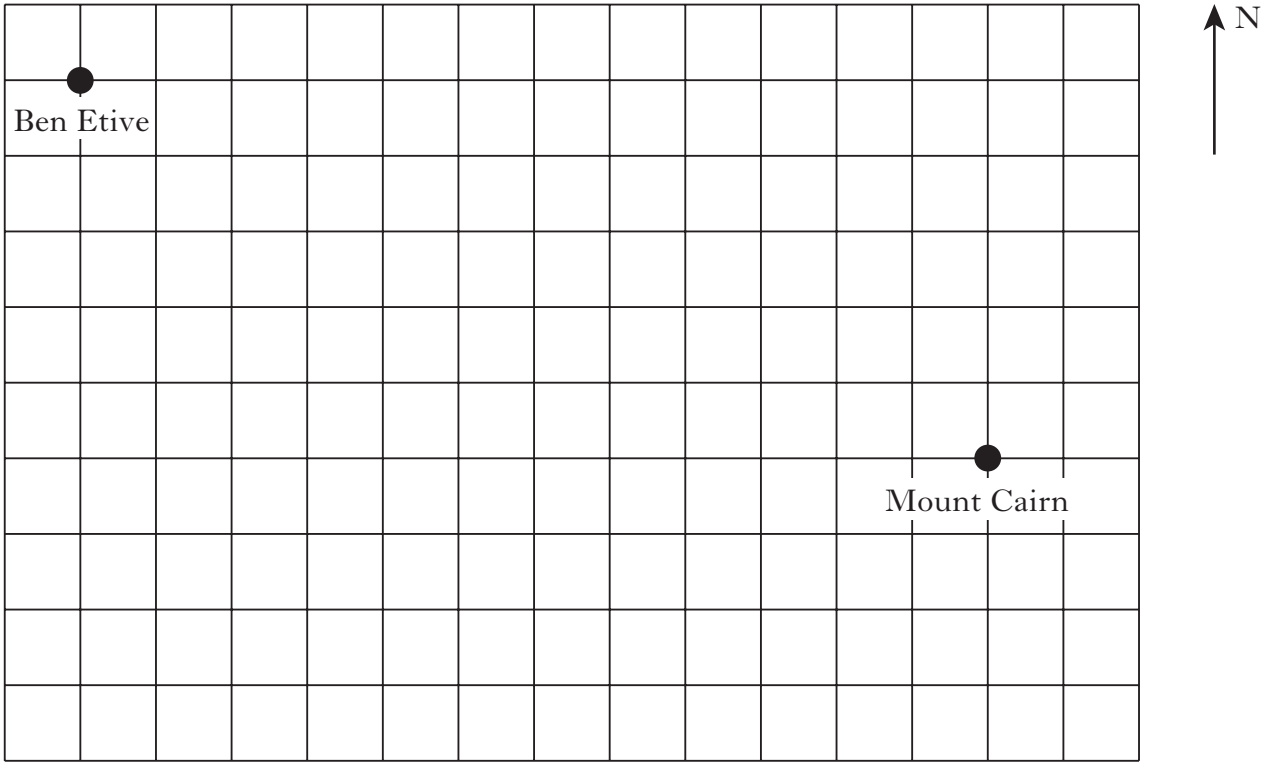


Work out the total cost for the group of six people to have a meal at 6.30 pm.

3



10. The scale drawing shows the positions of two mountain summits.  
The scale of the drawing is **1 centimetre represents 2 kilometres**.



- (a) Use the scale drawing to find the distance in kilometres between the summits of Ben Etive and Mount Cairn.

- (b) The summit of Ruthven Law lies on a bearing of
- $135^\circ$  from Ben Etive
  - $248^\circ$  from Mount Cairn.

Complete the scale drawing to show the position of Ruthven Law.

DO NOT  
WRITE IN  
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Marks

1

3





*Marks*

11. £4750 was invested in a savings account.  
The rate of interest was 2.4% per annum.  
How much interest was due after eight months?

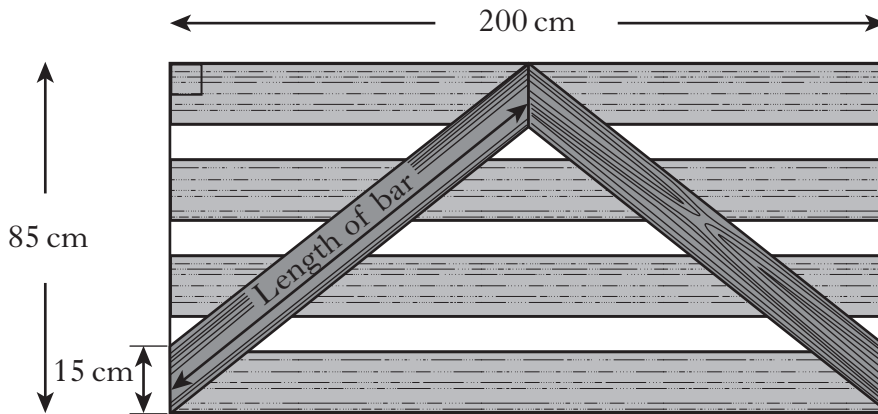
3

[Turn over



Marks

12. A wooden gate is 85 centimetres high and 200 centimetres wide.  
The gate is strengthened by two bars which meet half-way across the gate as shown.  
The ends of each bar measure 15 centimetres.



Calculate the length of **one** of the bars.  
**Do not use a scale drawing.**

4



Marks

13. Azra bought a washing machine priced £350.  
Including the delivery charge she paid a total of £371.  
Express the delivery charge as a percentage of the price of the washing machine.

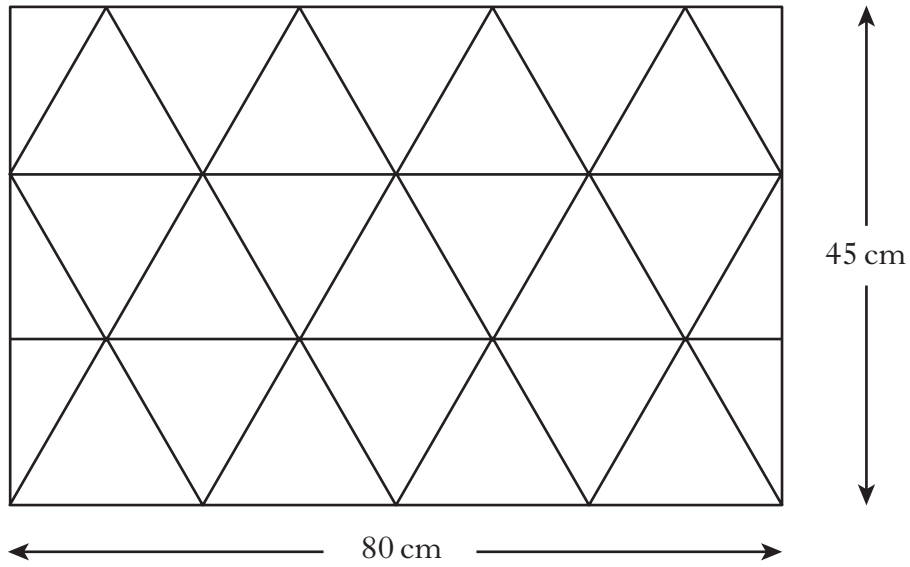
4

[Turn over



Marks

14. Part of a bathroom wall is covered with identical triangular tiles. Some tiles are cut in half.



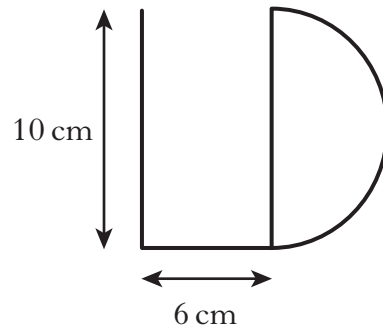
Calculate the area of one complete triangular tile.

3



Marks

15. Lizzie Douglas bends a length of wire into the shape of her initials.



The letter D is a semi-circle.

Calculate the total length of the wire.

Give your answer correct to the **nearest centimetre**.

5

[END OF QUESTION PAPER]



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