FOR OFFICIAL USE

G

	KU	RE
Total marks		

2500/403

NATIONAL QUALIFICATIONS 2008

THURSDAY, 8 MAY
10.40 AM – 11.15 AM

MATHEMATICS STANDARD GRADE

General Level
Paper 1
Non-calculator

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth
Day Month Year

Scottish candidate number

Number of seat

1 **You may <u>not</u> use a calculator.**

2 Answer as many questions as you can.

3 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.

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FORMULAE LIST

Circumference of a circle: $C = \pi d$

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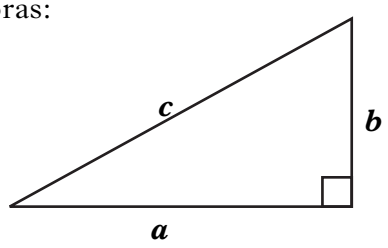
Curved surface area of a cylinder: $A = 2\pi rh$

Volume of a cylinder: $V = \pi r^2 h$

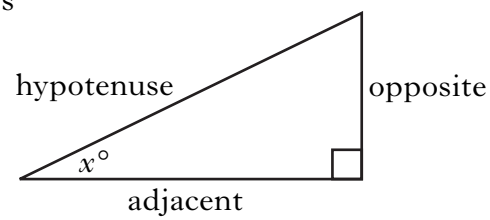
Volume of a triangular prism: $V = Ah$

Theorem of Pythagoras:



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

Trigonometric ratios in a right angled triangle:

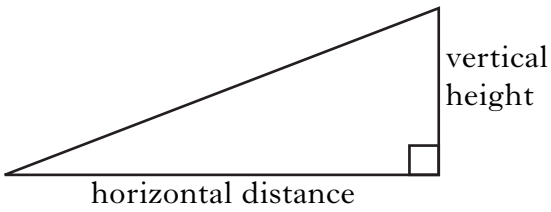


$$\textbf{tan } x^\circ = \frac{\textbf{opposite}}{\textbf{adjacent}}$$

$$\textbf{sin } x^\circ = \frac{\textbf{opposite}}{\textbf{hypotenuse}}$$

$$\textbf{cos } x^\circ = \frac{\textbf{adjacent}}{\textbf{hypotenuse}}$$

Gradient:



$$\textbf{Gradient} = \frac{\textbf{vertical height}}{\textbf{horizontal distance}}$$

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

1. Carry out the following calculations.

(*a*) $12{\cdot}76 - 3{\cdot}18 + 4{\cdot}59$

1

(*b*) $6{\cdot}39 \times 9$

1

(*c*) $8{\cdot}74 \div 200$

1

(*d*) $\frac{5}{6}$ of 420

2

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

2. In the "Fame Show", the percentage of telephone votes cast for each act is shown below.

Plastik Money	23%
Brian Martins	35%
Starshine	30%
Carrie Gordon	12%

Altogether 15 000 000 votes were cast.

How many votes did Starshine receive?

3

DO NOT WRITE IN THIS MARGIN

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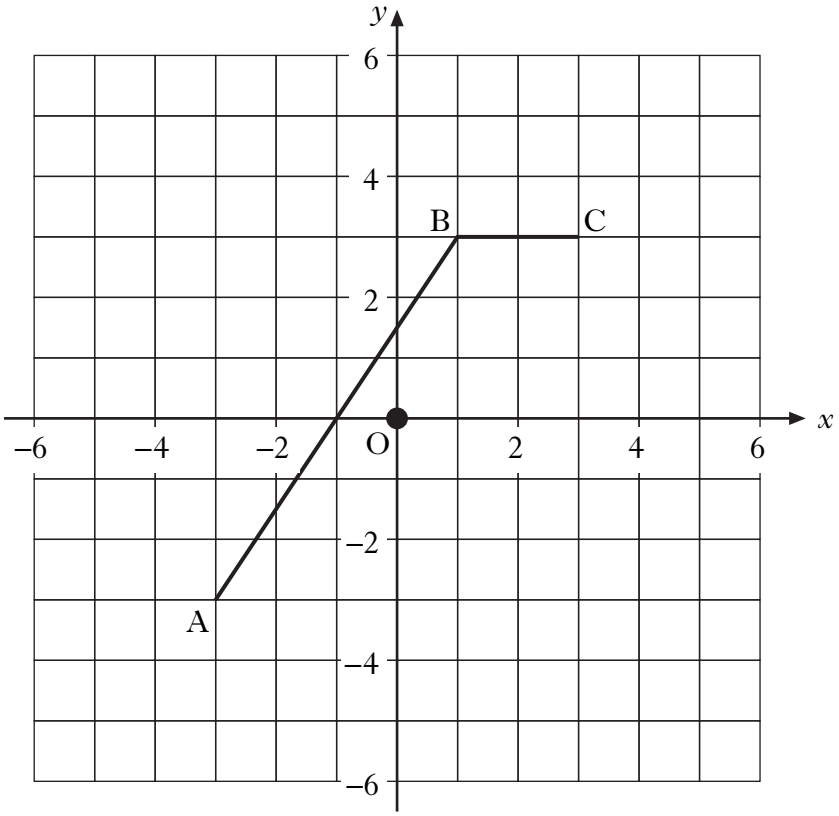
3. AB and BC are two sides of a kite ABCD.



(*a*) Plot point D to complete kite ABCD. **1**

(*b*) Reflect kite ABCD in the ***y*-axis**.

3

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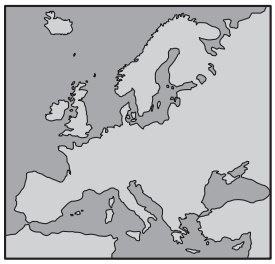
KU	RE

4. Europe is the world's second smallest continent.
Its area is approximately 10 400 000 square kilometres.
Write this number in scientific notation.



2

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

5. Samantha is playing the computer game "Castle Challenge".

To enter the castle she needs the correct four digit code.

The computer gives her some clues:

- only digits 1 to 9 can be used
- each digit is greater than the one before
- the sum of all four digits is 14.

(*a*) The first code Samantha found was 1, 3, 4, 6.

Use the clues to list all the possible codes in the table below.

1	**3**	**4**	**6**

3

(*b*) The computer gives Samantha another clue.

- three of the digits in the code are prime numbers

What is the four digit code Samantha needs to enter the castle?

1

[Turn over

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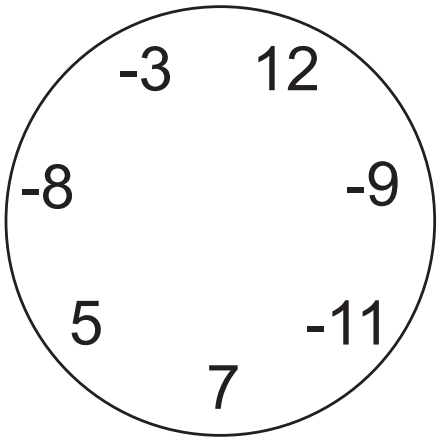
6.



The circle above contains seven numbers.

Find the three numbers from the circle which add up to −10.

You must show your working.

3

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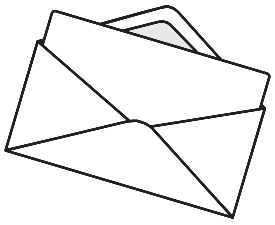
7. The cost of sending a letter depends on the size of the letter and the weight of the letter.



Format	Weight	Cost	
		1st Class Mail	2nd Class Mail
Letter	0–100 g	34p	24p
Large Letter	0–100 g	48p	40p
	101–250 g	70p	60p
	251–500 g	98p	83p
	501–750 g	142p	120p

Claire sends a letter weighing 50 g by 2nd class mail.

She also sends a large letter weighing 375 g by 1st class mail.

Use the table above to calculate the total cost.

3

[Turn over

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8. Four girls and two boys decide to organise a tennis tournament for themselves.

Each name is written on a plastic token and put in a bag.

(*a*) What is the probability that the first token drawn from the bag has a girl's name on it?

1

(*b*) The first token drawn from the bag has a girl's name on it.

This token is **not** returned to the bag.

What is the probability that the next token drawn from the bag has a boy's name on it?

2

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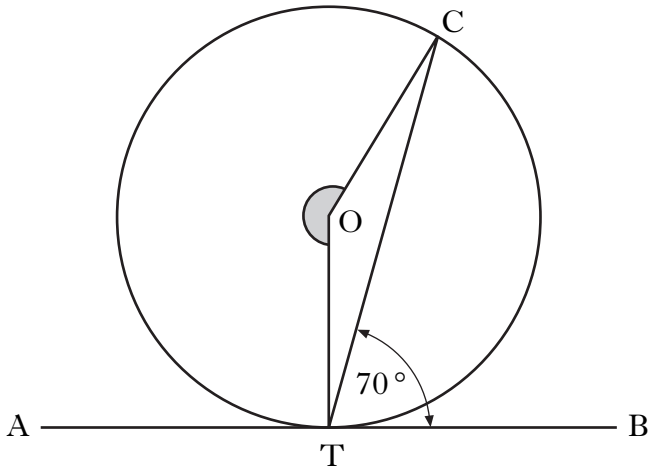
9.



In the diagram above:

- O is the centre of the circle
- AB is a tangent to the circle at T
- angle BTC = 70°.

Calculate the size of the shaded angle TOC.

3

[*END OF QUESTION PAPER*]

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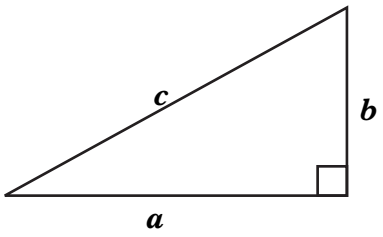

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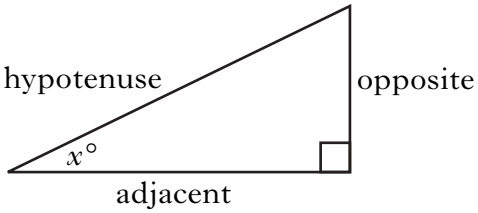

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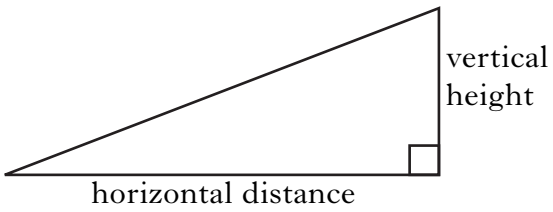

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1. Corrina has a part time job in a local pottery.

She paints designs on coffee mugs.

Her basic rate of pay is £6·25 per hour.

She also gets paid an extra 22 pence for every mug she paints.

Last week Corrina worked 15 hours and painted 40 mugs.

How much was she paid?

3

[Turn over

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2. Charlie's new car has an on-board computer.

At the end of a journey the car's computer displays the information below.

Journey information

distance **157.5 miles**

average speed **45 miles/hour**

Use the information above to calculate the time he has taken for his journey.

Give your answer in hours and minutes.

4

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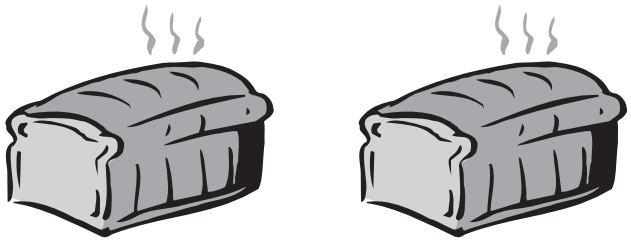
3.



Ben needs 550 grams of flour to bake two small loaves of bread.

(*a*) How many **kilograms** of flour will he need for thirteen small loaves?

2

Ben buys his flour in 1·5 kilogram bags.

(*b*) How many bags of flour will he need to bake the thirteen small loaves?

1

[Turn over

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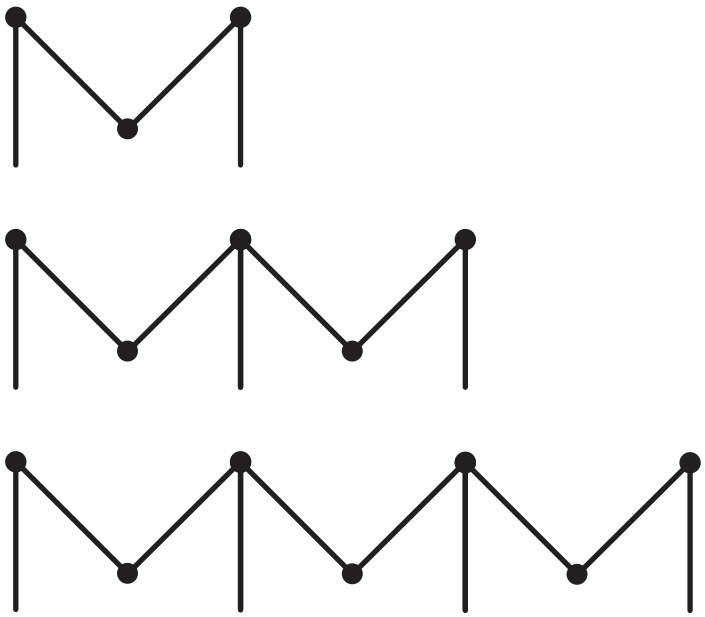
4. Mhairi makes necklaces in M-shapes using silver bars.



(*a*) Complete the table below.

Number of M-shapes (m)	1	2	3	4		15
Number of bars (b)	4	7				

2

(*b*) Write down a formula for calculating the number of bars (b) when you know the number of M-shapes (m).

2

(*c*) Mhairi has 76 silver bars.

How many M-shapes can she make?

2

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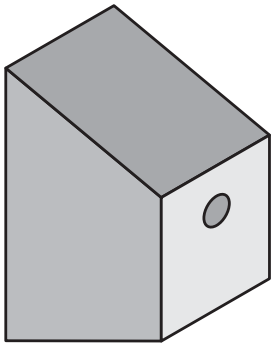
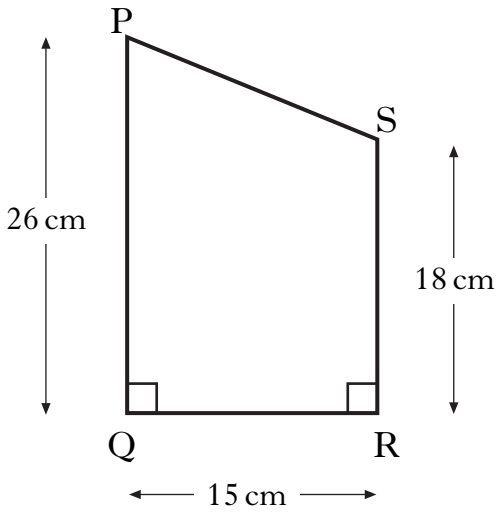
5. Lewis is designing a bird box for his garden.



The dimensions for the side of the box are shown in the diagram below.



Calculate the length of side PS.

Do not use a scale drawing.

4

[Turn over

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6. Gordon buys an antique teapot for £95.
He sells it on an Internet auction site for £133.
Calculate his percentage profit.

3		

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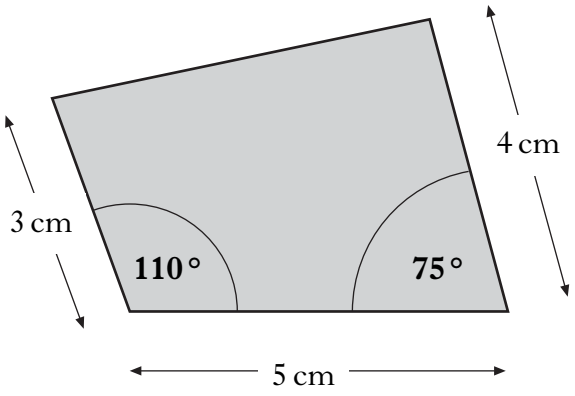
7. A piece of glass from a stained glass window is shown below.



A larger piece of glass, the same shape, is to be made using a scale of 2:1.

Make an accurate drawing of the larger piece of glass.

3

[Turn over

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8. (*a*) Solve algebraically

$$7t - 3 = t + 45.$$

3

(*b*) Factorise fully

$$20x - 12y.$$

2

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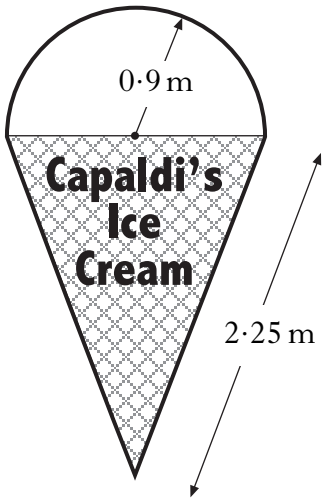
9. Ian is making a sign for Capaldi's Ice Cream Parlour.

The sign will have two equal straight edges and a semi-circular edge.

Each straight edge is 2·25 metres long and the radius of the semi-circle is 0·9 metres.



Calculate the perimeter of the sign.

4

[Turn over

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10. Natalie wanted to know the average number of hours cars were parked in a car park.

She did a survey of 100 cars which were parked in the car park on a particular day.

Her results are shown below.

Parking time (hours)	*Frequency*	*Parking time × frequency*
1	28	
2	22	
3	10	
4	15	
5	11	
6	5	
7	9	
	Total = 100	Total =

Complete the above table and find the mean parking time per car.

3

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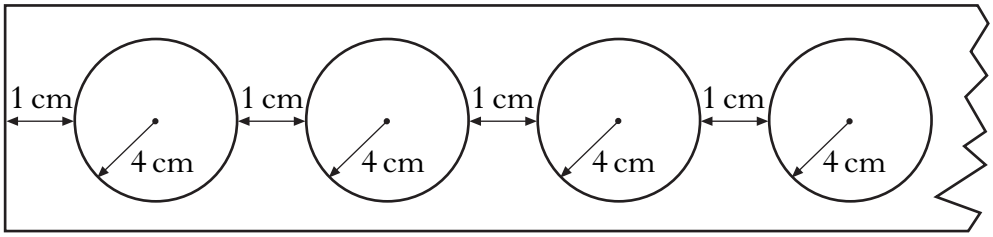
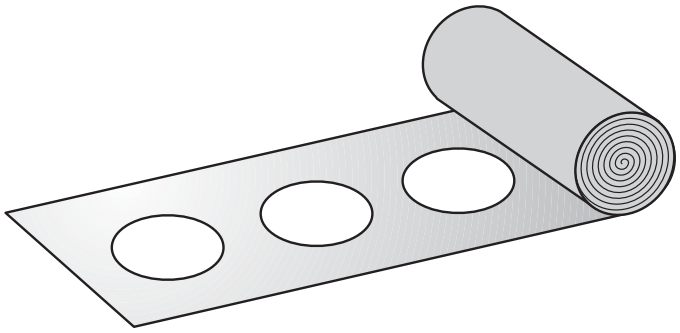
11. Circular tops for yoghurt cartons are cut from a strip of metal foil as shown below.



The radius of each top is 4 centimetres.

The gap between each top is 1 centimetre.



How many tops can be cut from a strip of foil 7 metres long?

4

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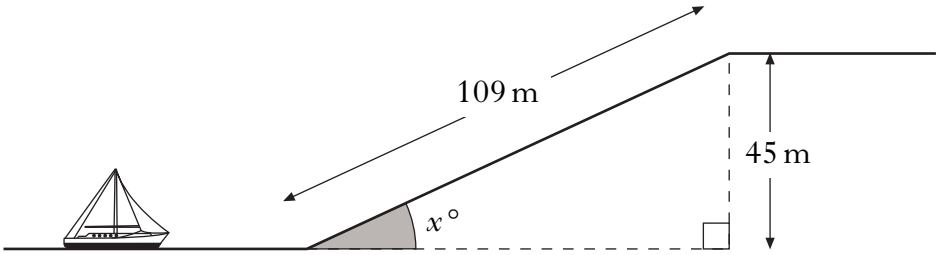
12. A boat elevator is used to take a boat from the lower canal to the upper canal.

The boat elevator is in the shape of a triangle.

The length of the hypotenuse is 109 metres.

The height of the triangle is 45 metres.



Calculate the size of the shaded angle $x°$.

3

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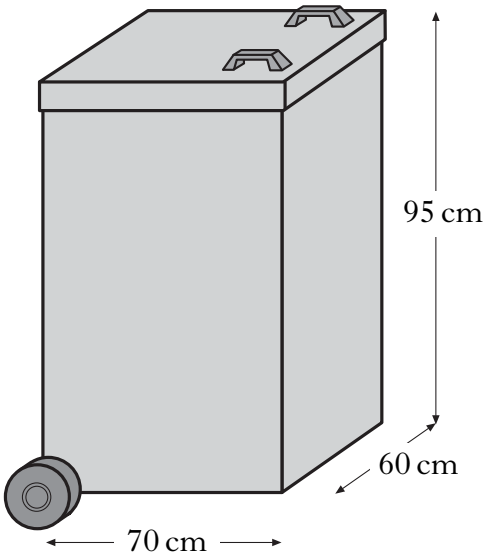
13. A wheelie bin is in the shape of a cuboid.

The dimensions of the bin are:

- length 70 centimetres
- breadth 60 centimetres
- height 95 centimetres.



(*a*) Calculate the volume of the bin.

2

(*b*) The council is considering a new design of wheelie bin.

The new bin will have the same volume as the old one.

The base of the new bin is to be a square of side 55 centimetres.

Calculate the height of the new wheelie bin.

3

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS