FOR OFFICIAL USE

G

	KU	RE
Total marks		

2500/403

NATIONAL QUALIFICATIONS 2009

WEDNESDAY, 6 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: $C = \pi d$

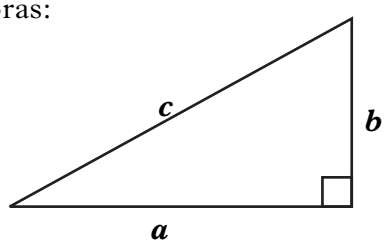
Area of a circle: $A = \pi r^2$

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

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

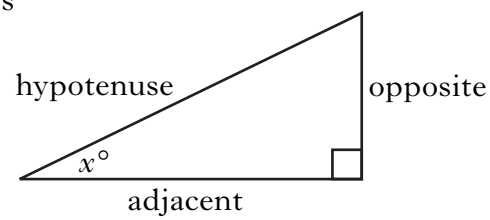
Volume of a triangular prism: $V = Ah$

Theorem of Pythagoras:



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

Trigonometric ratios in a right angled triangle:

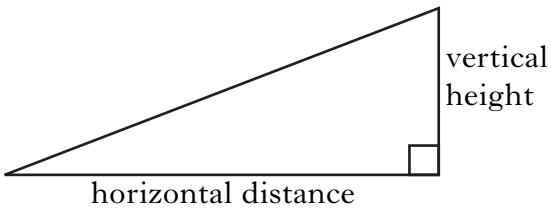


$$\textbf{tan } x^\circ = \frac{\textbf{opposite}}{\textbf{adjacent}}$$

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

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

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*) 17·3 – 14·86

1

(*b*) 23 × 6000

1

(*c*) 256·9 ÷ 7

1

(*d*) 80% of 54

2

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

2. An old unit of measurement called a fluid ounce is equal to 0·0296 litres.

Write 0·0296 in scientific notation.

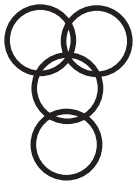
2

DO NOT WRITE IN THIS MARGIN

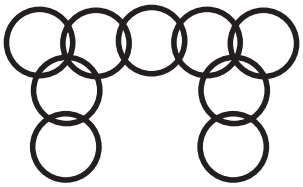
Marks | KU | RE

3. Samira is designing a chain belt.

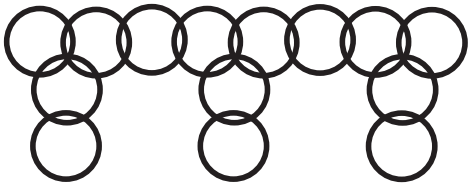
Each section of the belt is made from metal rings as shown below.



1 section, 4 rings



2 sections, 9 rings



3 sections

(*a*) Complete the table below.

Number of sections (s)	1	2	3	4	5		11
Number of metal rings (r)	4	9					

2

(*b*) Write down a formula for calculating the number of rings (r), when you know the number of sections (s).

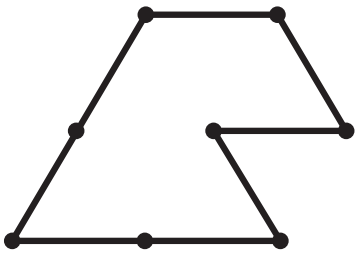
2

(*c*) Samira uses 79 rings to make her belt.

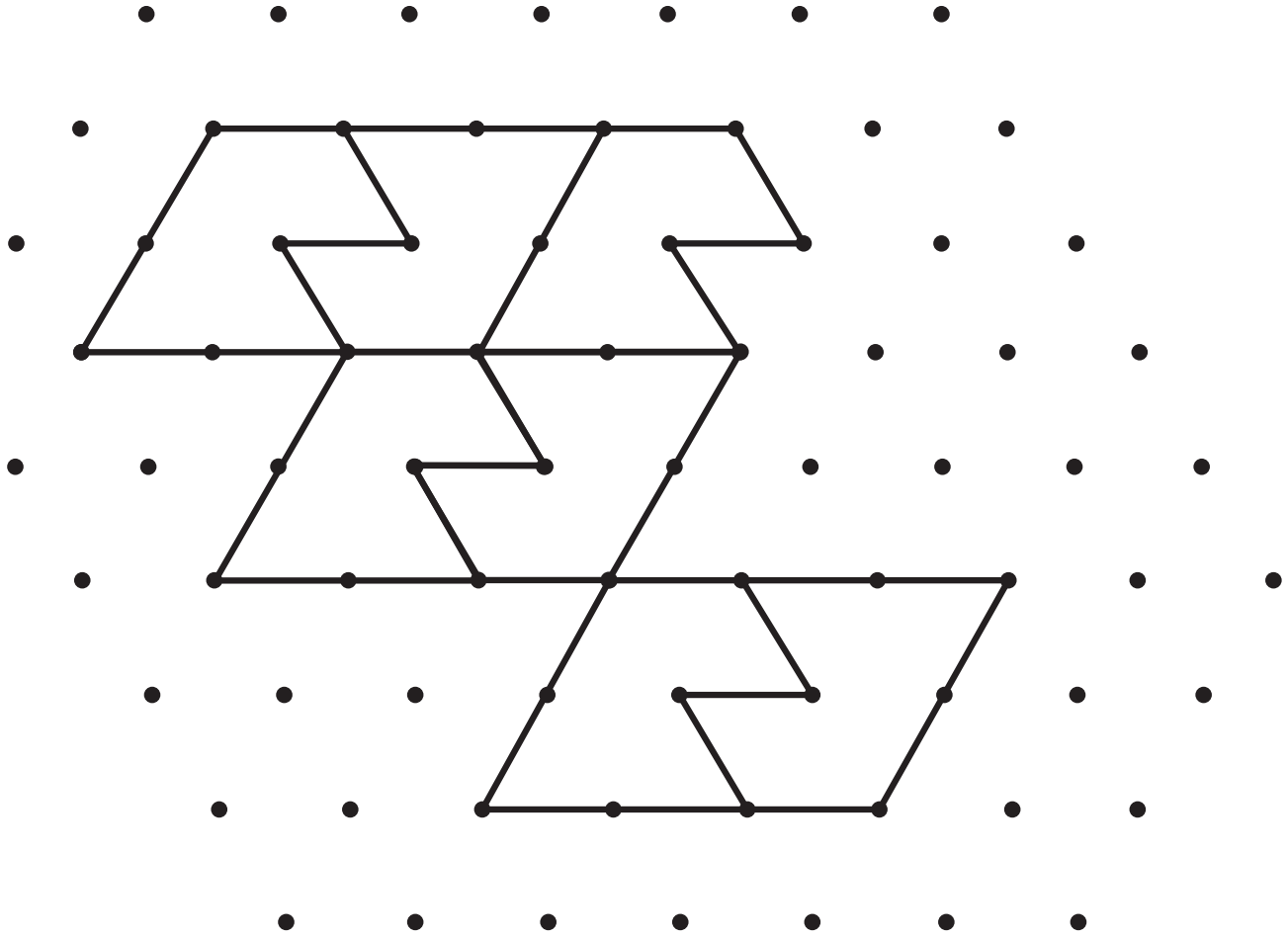
How many sections does her belt have?

2

4. A floor is to be tiled using tiles shaped like this.



Here is part of the tiling.



DO NOT WRITE IN THIS MARGIN

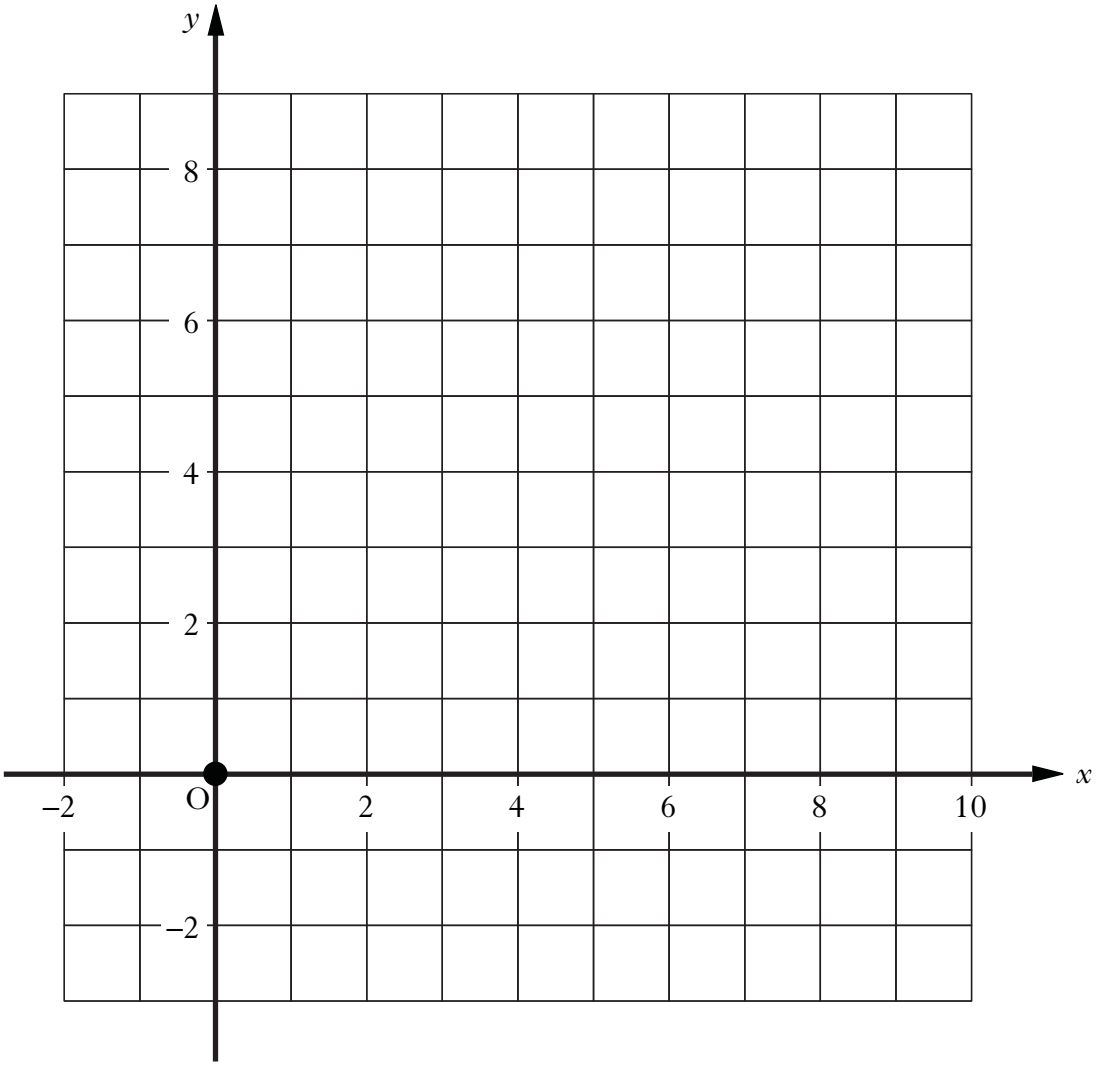
Marks	KU	RE
3		

Draw **four** more tiles to continue the tiling.

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

5. (*a*) On the grid below, plot the points A(2, 6), B(8, 2) and C(6, –1).



2

(*b*) Plot a fourth point D so that ABCD is a rectangle. **1**

(*c*) On the grid, show the point where the diagonals of the rectangle intersect.

Write down the coordinates of this point.

2

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

6. In July the average temperature in Anchorage, Alaska is 9 °C.

By January the average temperature has fallen by 26 °C.

What is the average temperature in Anchorage in January?

2

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Marks	KU	RE

7. Joe is making a fruit pudding on Scottish Master Chef.

In the fruit pudding recipe the ratio of raspberries to blackberries is 5:1.

Joe's fruit pudding must contain a **total** of 240 grams of fruit.

Calculate the weight of raspberries in his pudding.

3

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

8. Each pupil in a science class is growing a plant.

A few weeks later the height of each plant is measured.

The heights in centimetres are shown below.

6·3	5·4	5·8	7·0	6·2	7·6	8·3	8·4	5·3	8·8
8·5	5·6	6·8	6·5	6·1	6·7	7·4	7·6	5·3	

(*a*) Display these results in an ordered stem and leaf diagram.

3

(*b*) Find the median height.

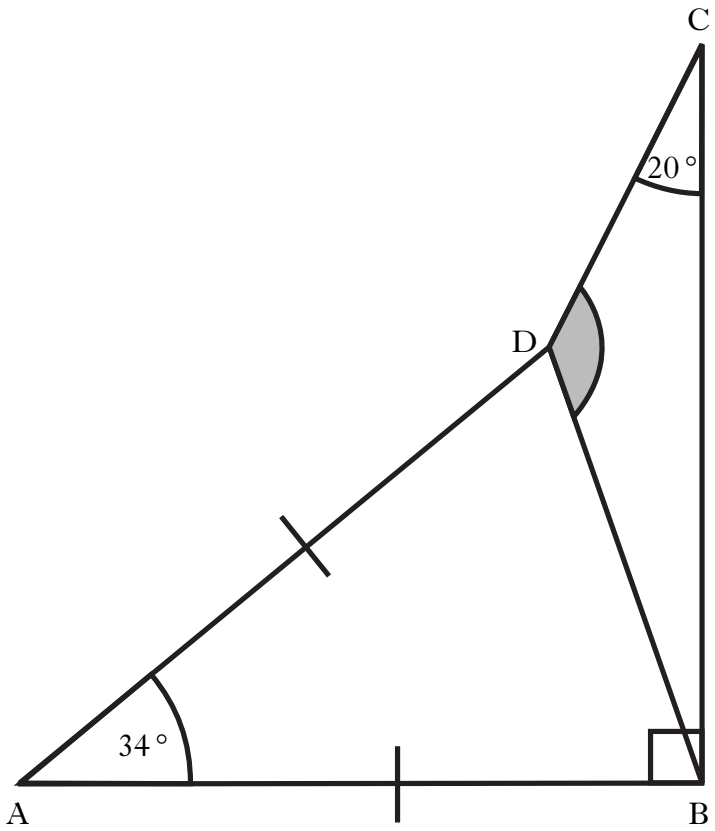
1

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

9. In the diagram below:

- triangle ABD is isosceles with AB = AD
- angle DAB = 34°
- angle ABC = 90°
- angle BCD = 20°.



Calculate the size of the shaded angle BDC.

3

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

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NATIONAL QUALIFICATIONS 2009

WEDNESDAY, 6 MAY
11.35 AM – 12.30 PM

MATHEMATICS STANDARD GRADE

General Level
Paper 2

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Surname

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Day Month Year

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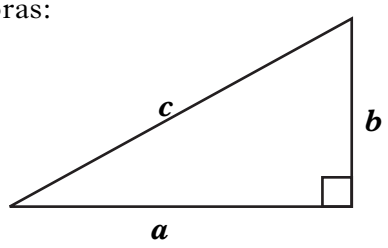

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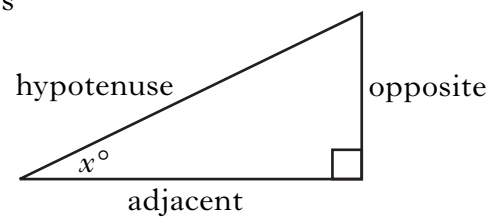

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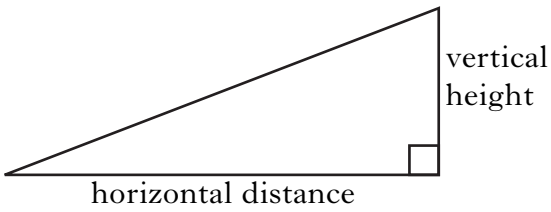

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1. Naveen drives from Dumfries to Manchester.

A 28 mile part of his journey is affected by roadworks.

It takes him 40 minutes to drive this part of his journey.

Calculate his average speed for this part of his journey.

Give your answer in miles per hour.

3

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

2. Helen travels between Glasgow and Edinburgh by train.

She buys a monthly TravelPass which costs £264·30.

A daily return ticket would cost £16·90.

Last month Helen made 19 return journeys.

How much did she save by buying the TravelPass?

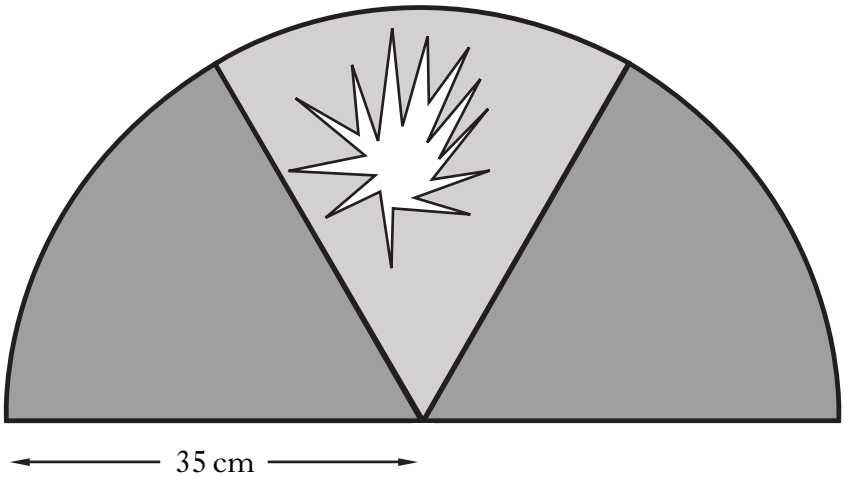
3

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

3. A semi-circular window in the school assembly hall is made from three identical panes of glass.

During a recent storm one pane of glass was damaged.



The semi-circle has a radius of 35 centimetres.

Calculate the area of the damaged pane of glass.

3

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

4. John is going to see a movie.

The movie has an evening and a late night showing.

	Evening showing	Late night showing
Start time	1750	
Finish time	2005	0110

(*a*) How long does the movie last?

1

(*b*) When does the late night showing start?

2

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

5. (*a*) Factorise

$$6c - 15d.$$

2

(*b*) Simplify

$$5(a + 1) + 2(5 - 2a).$$

3

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

6. David is trying to decide which channel mixes to buy for his TV system.

The cost of each is:

- Drama Mix £7
- Sport Mix £20
- Movies Mix £15
- Kids Mix £12
- Music Mix £10

He has decided to buy four different mixes.

One possible selection and its cost are shown in the table below.

(*a*) Complete the table showing all the possible selections and the cost of each.

Selections				**Cost**
Drama	Sport	Movies	Music	£52

3

(*b*) David can spend up to £55 for his selection.

Which selection can he **not** buy?

1

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

7. Last week Theresa asked 76 students to record how many hours they spent doing homework.

The results are shown below.

Homework hours	*Frequency*	*Homework hours × frequency*
1	16	
2	12	
3	18	
4	11	
5	8	
6	6	
7	5	
	Total = 76	Total =

Complete the above table and find the **mean** time spent on homework last week.

Round your answer to 1 decimal place.

4

DO NOT WRITE IN THIS MARGIN

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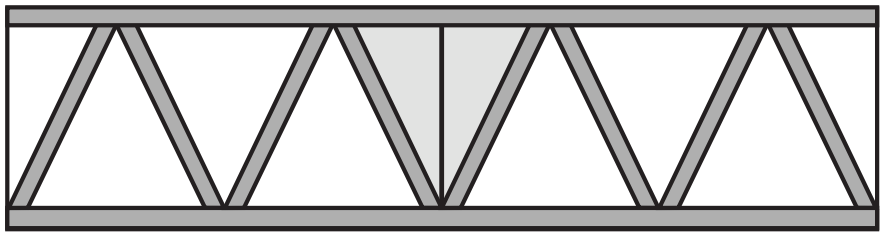
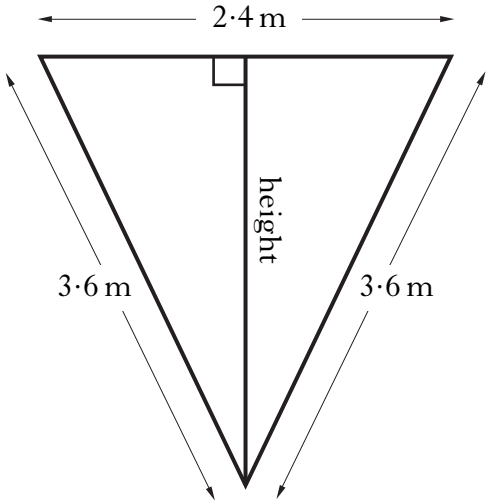
8. A steel plate in the shape of an isosceles triangle is used to strengthen a bridge.



The dimensions of the isosceles triangle are shown below.



Calculate the height of the steel plate.

Do not use a scale drawing.

4

DO NOT WRITE IN THIS MARGIN

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9.

Pizza Perfection — free delivery				
	Deep Base		**Thin Base**	
	9-inch	**12-inch**	**9-inch**	**12-inch**
Margherita	£3·60	£5·00	£3·30	£4·60
Mushroom	£4·25	£5·80	£4·15	£5·50
Pepperoni	£5·00	£6·30	£4·90	£6·00
Vegetarian	£5·05	£6·35	£4·95	£6·05
Hot Spicy	£5·15	£6·45	£5·05	£6·15

Iona and her friends order some pizzas to be delivered.

They order a 9-inch Hot Spicy deep base, a 12-inch Margherita deep base and two 12-inch Vegetarian thin base.

Find the total cost of the order.

3

[Turn over

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Marks | KU | RE

10. Susan has £6200 in her Clydeside Bank account.

Clydeside Bank pays interest at 2·5% per annum.

Highland Bank pays interest at 3·7% per annum.

How much more money would Susan get in interest if she moved her £6200 to the Highland Bank for one year?

3

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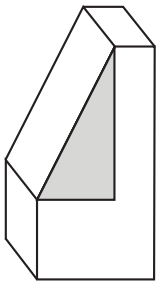
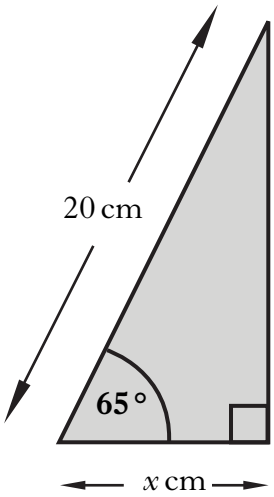
Marks	KU	RE

11. The shaded part of a garden light is triangular.





- the triangle is right angled
- the sloping edge is 20 centimetres long
- the angle between the base and the sloping edge is 65 °.

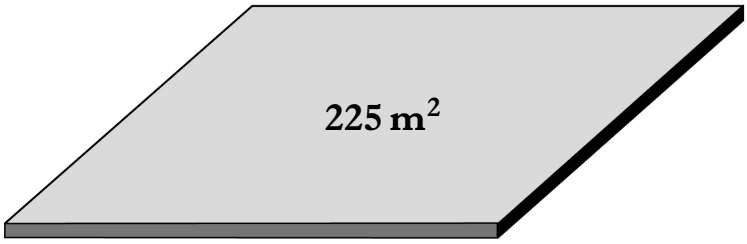
Calculate the value of x.

3

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

12. The local council is installing a new children's playpark using a rubberised material.



The area of the rectangular playpark is 225 square metres.

The new playpark must have a depth of 12 centimetres.

The council has ordered 30 cubic metres of the rubberised material for the playpark.

Will this be enough?

Give a reason for your answer.

3

DO NOT WRITE IN THIS MARGIN

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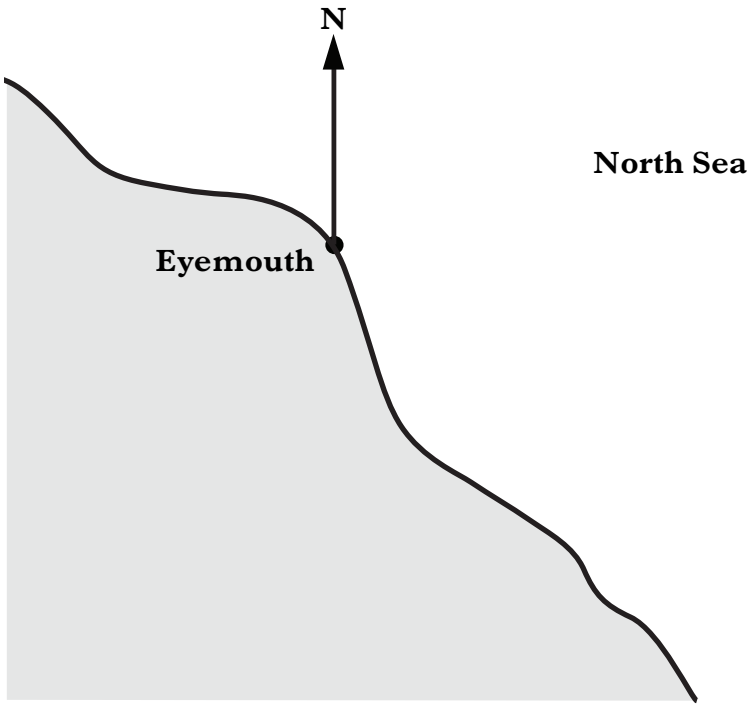
13. An off shore wind farm is on a bearing of 115° and at a distance of 90 kilometres from Eyemouth.

Using a scale of 1 centimetre to represent 10 kilometres, show the position of the wind farm on the diagram below.



3

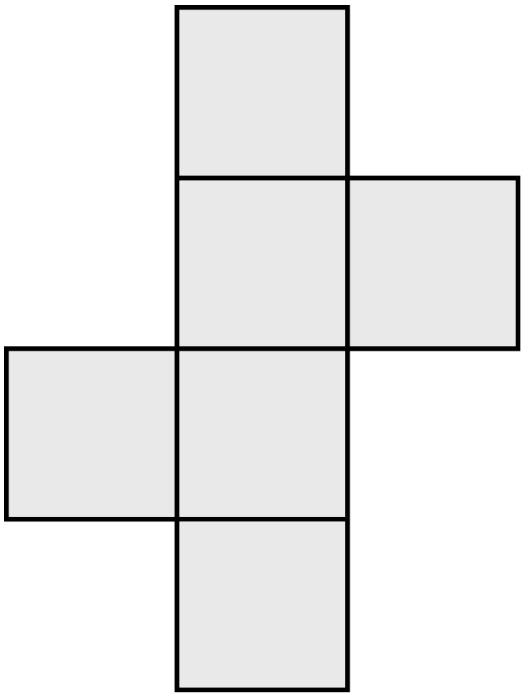
[Turn over for Question 14 on *Page sixteen*

DO NOT WRITE IN THIS MARGIN

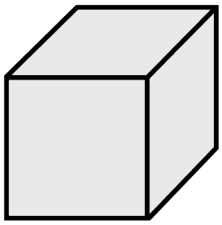
Marks	KU	RE

14. The diagram below shows the net of a cube.

The total surface area of the cube is 150 square centimetres.



Net of Cube



Cube

Calculate the length of the side of the cube.

3

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

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