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	KU	RE
Paper 1		
Paper 2		
<b>Total</b>		

**2500/403**

NATIONAL  
QUALIFICATIONS  
2011

WEDNESDAY, 4 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

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Scottish candidate number

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Number of seat

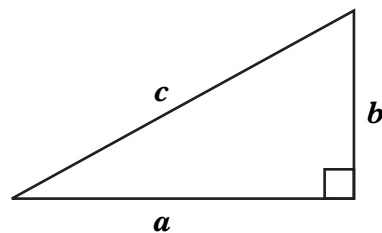
1. You may **not** use a calculator.
2. Answer as many questions as you can.
3. Write your working and answers in the spaces provided. Additional space is provided at the end of this question-answer book for use if required. If you use this space, write clearly the number of the question involved.
4. Full credit will be given only where the solution contains appropriate working.
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## FORMULAE LIST

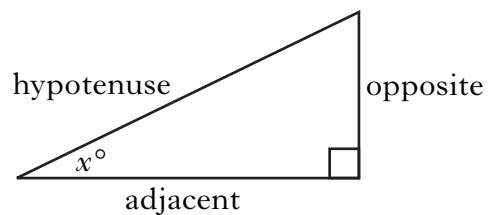
Circumference of a circle:	$C = \pi d$
Area of a circle:	$A = \pi r^2$
Curved surface area of a cylinder:	$A = 2\pi r h$
Volume of a cylinder:	$V = \pi r^2 h$
Volume of a triangular prism:	$V = Ah$

Theorem of Pythagoras:



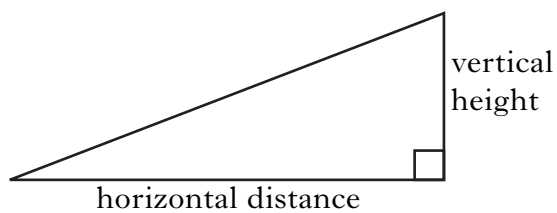
$$a^2 + b^2 = c^2$$

Trigonometric ratios  
in a right angled  
triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$
$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$
$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Gradient:



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

1. Carry out the following calculations.

(a)  $437.5 - 95.61$

(b)  $18.4 \times 700$

(c)  $0.258 \div 6$

(d) Find  $\frac{2}{3}$  of 24

<i>Marks</i>	KU	RE
<b>1</b>		
<b>1</b>		
<b>1</b>		
<b>2</b>		

**[Turn over**

2. The thickness of a hair on Robbie's head is 0.00254 centimetres.  
Write 0.00254 in scientific notation.

*Marks*

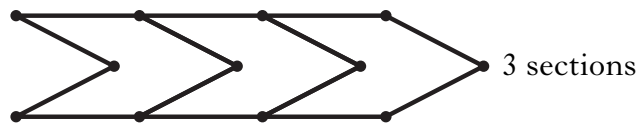
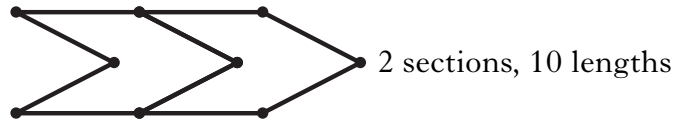
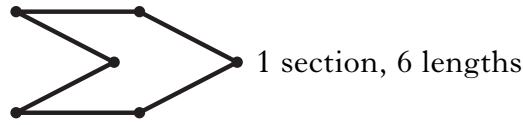
KU	RE
2	

Marks

KU	RE
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3. Margaret is working on the design for a gold bracelet.

She is using gold lengths to make each section.



(a) Complete the table below.

Number of sections ( $s$ )	1	2	3	4		10
Number of gold lengths ( $g$ )	6	10				

2

(b) Write down a formula for calculating the number of gold lengths, ( $g$ ), when you know the number of sections ( $s$ ).

2

(c) Margaret uses 66 gold lengths to make a bracelet.  
How many sections does this bracelet contain?

2

[Turn over

Marks

	KU	RE
1		
2		
1		

4. Sean draws a stem and leaf diagram to display charity donations.

**Donation (£)**

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

$n = 20$

4 | 5 represents £45

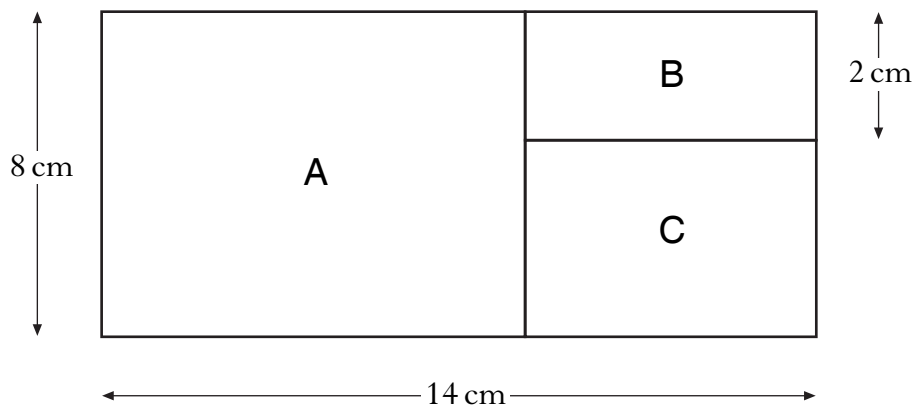
Using the above diagram, find:

(a) the mode;

(b) the median;

(c) the range of the donations.

5. The diagram below shows a large rectangle that has been divided into 3 small rectangles. *Marks*  
 The small rectangles are labelled A, B and C.  
 Some of the dimensions are given on the diagram.



Rectangle B has an area of 10 square centimetres.  
 Calculate the area of rectangle A.

4

[Turn over

	KU	RE
4		

6. Tom compared the temperatures in the Sahara Desert and at the North Pole.

The temperature in the Sahara Desert was  $32^\circ\text{C}$ .

The temperature at the North Pole was  $46^\circ\text{C}$  less than the temperature in the Sahara Desert.

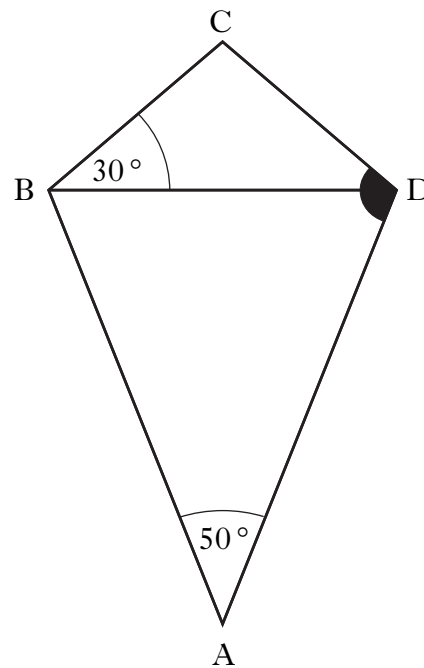
What was the temperature at the North Pole?

Marks

KU	RE
2	
3	

7. In the diagram:

- ABCD is a kite
- Angle DAB =  $50^\circ$
- Angle DBC =  $30^\circ$



Calculate the size of shaded angle ADC.



Marks

KU RE

8.

**Urban Wildlife Park**



Admission Charges	
Adult	£13·50
Children aged 3 and under	£10·75
Children aged 4 to 16	£11·50
Family Ticket (1 Adult & 2 Children)	£32·00
Family Ticket (2 Adults & 2 Children)	£42·00
Family Ticket (2 Adults & 3 Children)	£51·00

Alan and Kate take their 12 year old twin daughters to the Urban Wildlife Park.

Instead of buying four individual tickets, they decide to buy a Family Ticket.

How much money do they save?

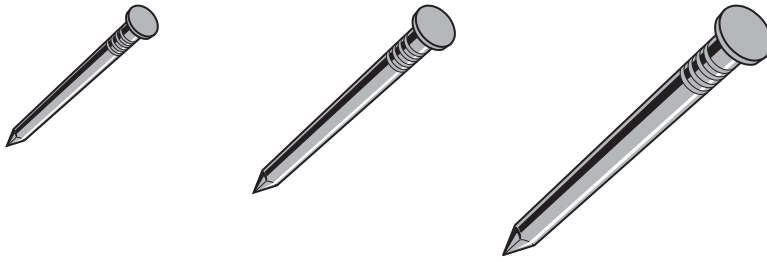
3

[Turn over for Question 9 on *Page ten*]

Marks

KU	RE
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9. Three steel nails are shown below.



The lengths of the nails are in the ratio  $1 : 3 : 5$ .  
The length of the middle nail is 7.5 centimetres.  
Calculate the length of the large nail.

3	

[END OF QUESTION PAPER]

**ADDITIONAL SPACE FOR ANSWERS**

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Scottish candidate number

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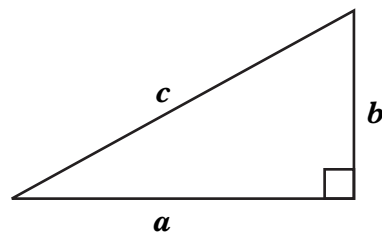
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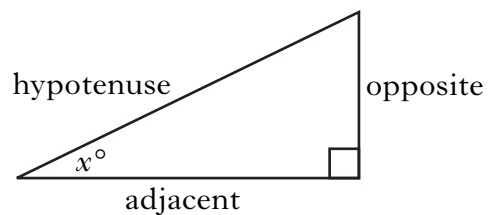
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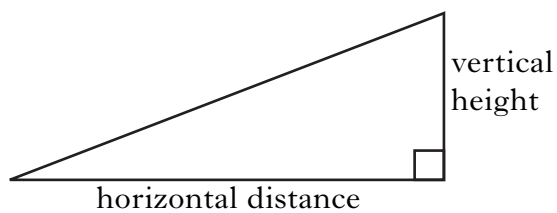
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Gradient:



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

1. Tariq has a £216 000 mortgage.  
The interest rate on this mortgage is 4.5% per annum.  
How much does Tariq pay in interest **each month**?



*Marks*

KU RE

3

[Turn over

Marks

KU	RE

2. There are 2 yellow, 3 red, 1 blue and 4 orange cubes in a bag.

(a) Jason takes a cube from the bag.

What is the probability that it is orange?

1

(b) The cube is replaced in the bag and 3 white cubes are added to the bag.

What is the probability that the next cube taken from the bag is **not** red?

2

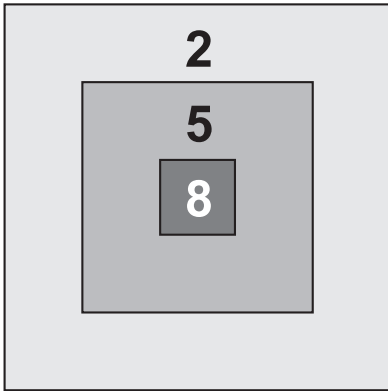




Marks

KU	RE
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4. For the school gala day the maths teachers have invented a game.  
To play the game each person throws **three** bean bags at the target.



**Score**  
8 points for hitting the “Centre” part  
5 points for hitting the “Middle” part  
2 points for hitting the “Outer” part

All three bean bags must hit the target to win a prize.

Prizes are won for **15 points or more**.

Complete the table below to show all the different ways to win a prize.

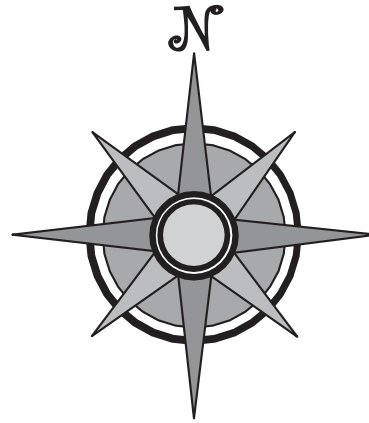
Number of bean bags scoring 8 points	Number of bean bags scoring 5 points	Number of bean bags scoring 2 points	Total Points
2	0	1	18

4

5. Millie and her friends are going hillwalking.

Millie tells her friends that they will start their walk by heading Southwest.

(a) What is the three-figure bearing for Southwest?



Marks

	KU	RE
1		
1		

Later on, Millie tells her friends that they need to walk on a bearing of  $135^\circ$ .

(b) What direction is represented by a bearing of  $135^\circ$ ?

**[Turn over**

6. (a) Factorise fully

$$18 + 12t.$$

(b) Solve algebraically

$$5m - 3 = 37 + m.$$

Marks

KU RE

2

3

Marks

KU	RE
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7. Sally can record and store television programmes using her TV plus system.

The display on her system shows

- maximum storage space 80 hours
- storage space remaining 13%.

**TVplus**

- ✦ Maximum storage: 80 hours
- ✦ Remaining storage: 13%

The new TV series of “City Life” has 12 episodes each lasting 55 minutes.

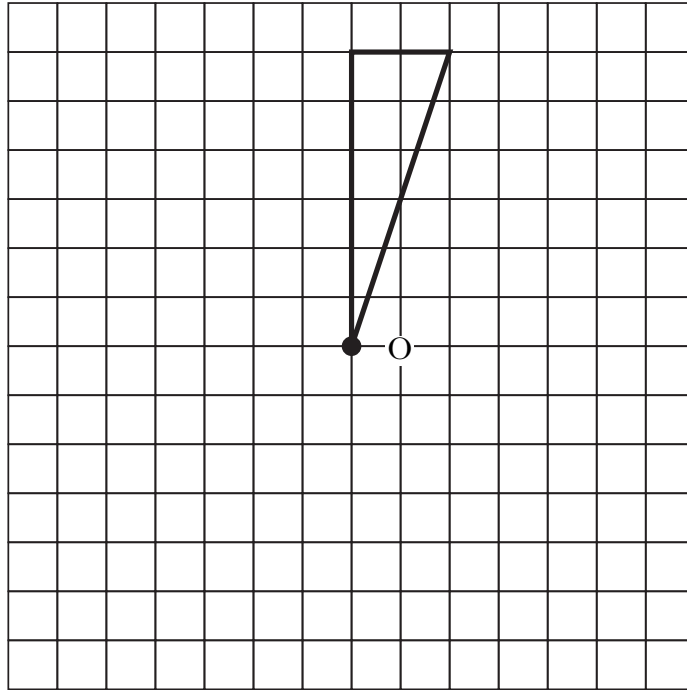
Can she record the whole of the “City Life” series on the remaining storage space?

**Give a reason for your answer.**

4

[Turn over

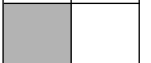
8. Complete this shape so that it has half-turn symmetry about O.



Marks

KU	RE
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2

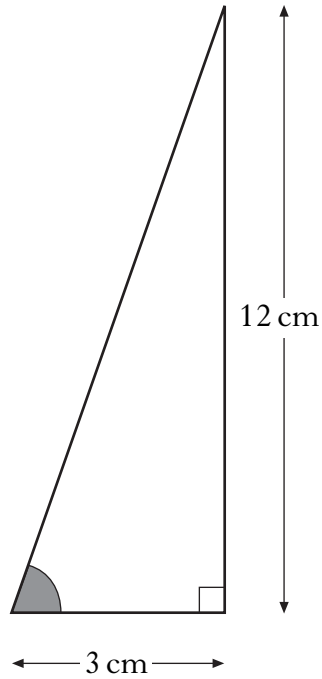
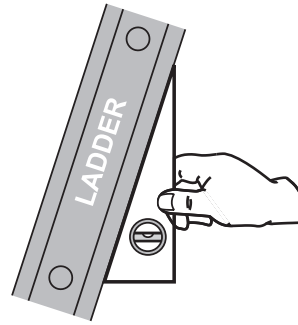


Marks

9. Larry has invented a device for checking that ladders are positioned at the correct angle.

His design for the device is given below.

Calculate the size of the shaded angle.

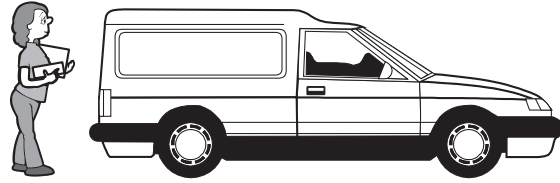


	KU	RE
3		

[Turn over

**10.** Vicky makes a number of deliveries in her van.

When the van is moving the on-board computer records the total distance and the average speed.



Last Wednesday the computer recorded

- distance = 162 miles
- average speed = 36 miles per hour.

Including stops, Vicky took 6 hours 55 minutes to complete her deliveries.

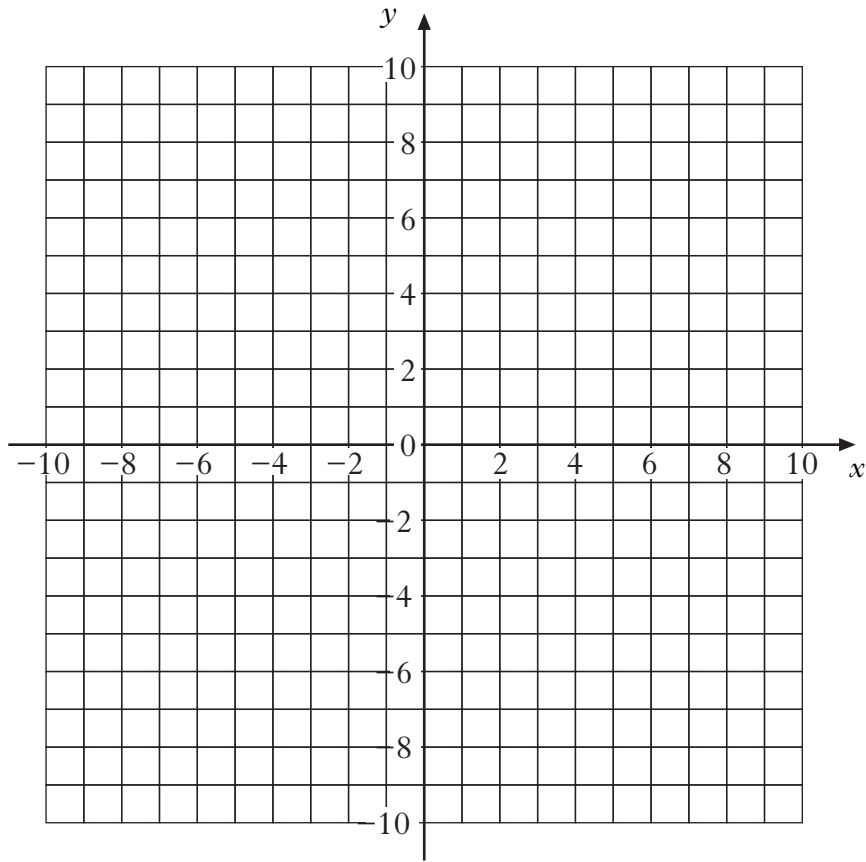
For how long was Vicky's van stationary?

*Marks*

KU	RE
<b>4</b>	



11. (a) On the grid below, plot the points P  $(-7, -3)$  and Q  $(5, 6)$ .



(b) Find the gradient of line PQ.

Marks

	KU	RE
1		
2		

[Turn over



Marks

KU	RE
----	----

13. Helen has recorded the scores for her last eighteen games of golf.  
Her scores are shown below.

<i>Score</i>	<i>Frequency</i>	<i>Score × Frequency</i>
69	3	
70	2	
71	4	
72	4	
73	2	
74	1	
75	2	
	Total = 18	Total =

Complete the above table and find Helen's **mean** score per game.  
Round your answer to 1 decimal place.

4

[Turn over for Question 14 on Page sixteen

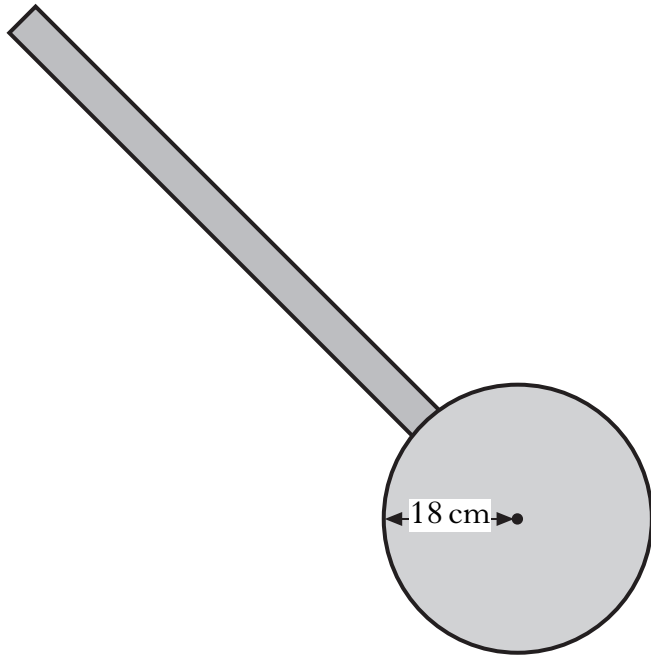
Marks

KU	RE
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14. Alex uses a circular piece of wood to make a measuring wheel.

The wheel has a radius of 18 centimetres.

How many complete metres are measured by 15 rotations of the wheel?



4	

[END OF QUESTION PAPER]

**ADDITIONAL SPACE FOR ANSWERS**

**ADDITIONAL SPACE FOR ANSWERS**

**ADDITIONAL SPACE FOR ANSWERS**

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