

FOR OFFICIAL USE

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G

2500/403

	KU	RE
Total marks		

NATIONAL
QUALIFICATIONS
2005

FRIDAY, 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

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Scottish candidate number

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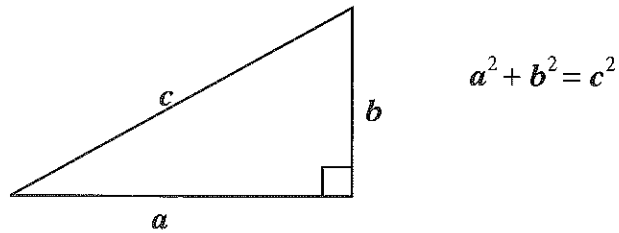
Number of seat

- 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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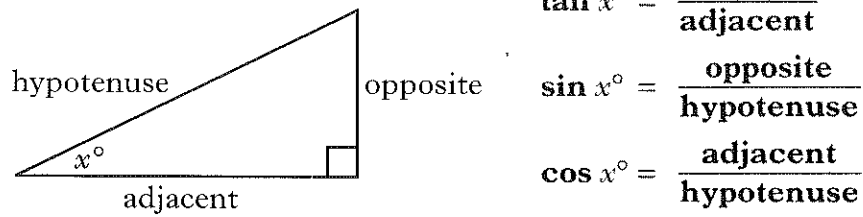
FORMULAE LIST

- 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: $V = Ah$

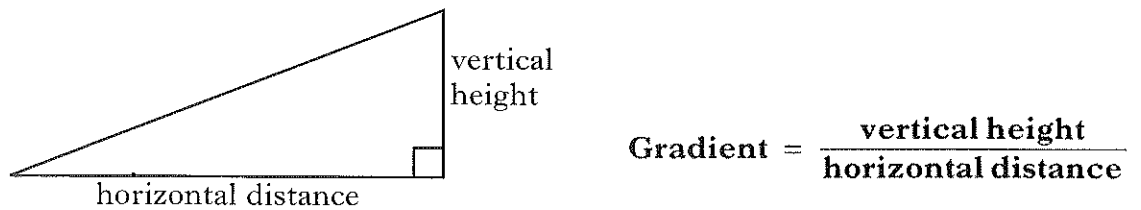
Theorem of Pythagoras:



Trigonometric ratios
in a right angled
triangle:



Gradient:



1. Carry out the following calculations.

(a) $209.3 - 175.48$

(b) 56.7×90

(c) $324.1 \div 7$

(d) $\frac{3}{4}$ of 56 cm

2. When an aircraft leaves Prestwick airport the outside temperature is 12° Celsius.
The aircraft climbs to 10 000 metres and the outside temperature is -50° Celsius.
Find the difference between these temperatures.

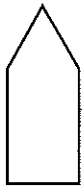


Marks

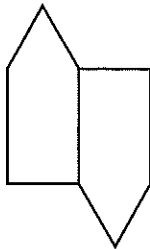
	KU	RE
1		
1		
1		
2		
2		

3. Sandra is working on the design for a bracelet.
She is using matches to make each shape.

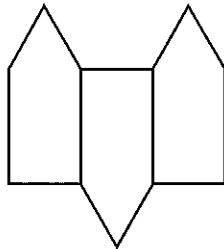
Shape 1



Shape 2



Shape 3



Shape 4

- (a) Draw shape 4.
(b) Complete the following table.

Shape number (s)	1	2	3	4	5	6		13
Number of matches (m)	5	9			21			

- (c) Find a formula for calculating the number of matches, (m), when you know the shape number, (s).

- (d) Which shape number uses 61 matches?

You must show your working.

Marks

KU RE

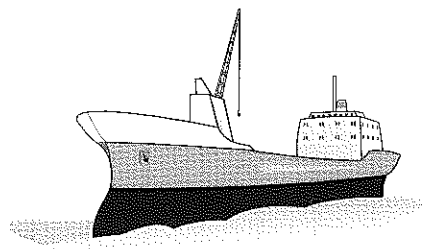
1

2

2

2

4. A ship is transporting 2800 cars.
Each car is worth £20 000.



Marks

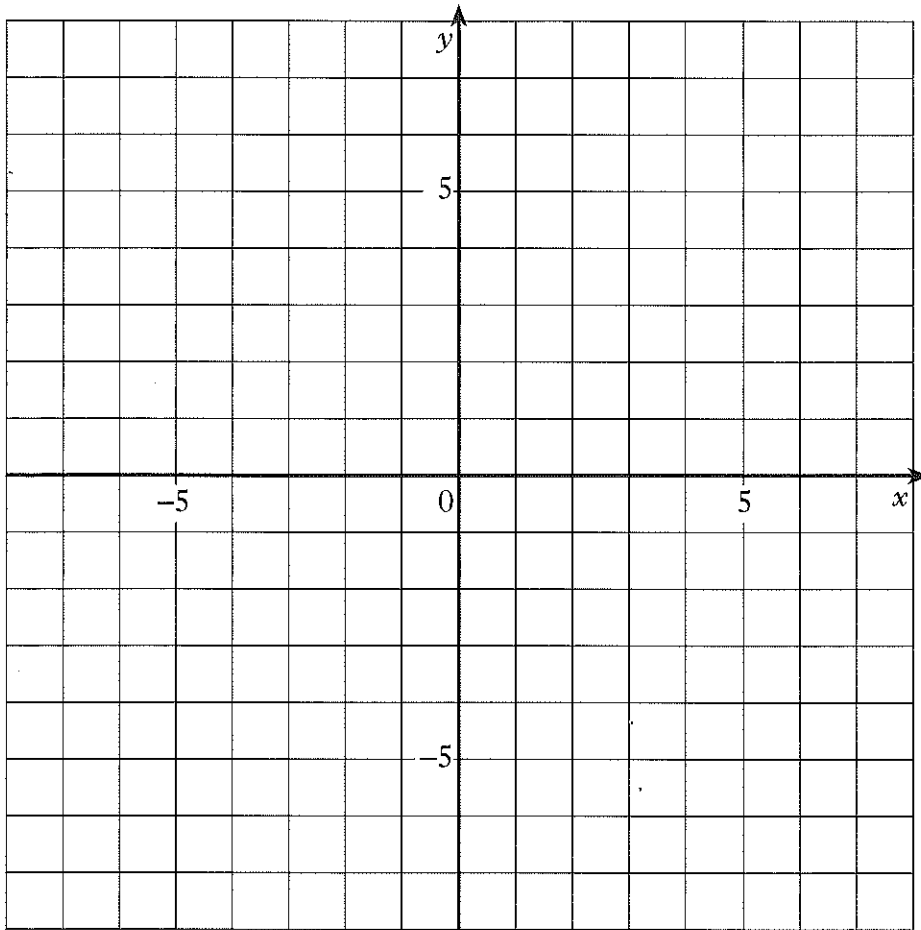
	KU	RE
1		
1		

(a) What is the total value of all the cars?

(b) Write the total value in scientific notation.

[Turn over

5. (a) On the grid below, plot the points A(7, 5), B(5, -1) and C(-1, -3).



- (b) Plot a fourth point D so that ABCD is a rhombus.
(c) Reflect rhombus ABCD in the **y-axis**.

Marks

	KU	RE
2		
1		
2		

6. The table below can be used to convert tyre pressures from pounds per square inch (lb/sq in) to kilograms per square centimetre (kg/sq cm).

Marks

lb/sq in	20	22	24	26	28	30	32	34
kg/sq cm	1.41	1.55	1.69	1.83	1.97	2.11	2.25	2.39

Convert **29 lb/sq in** to **kg/sq cm**.

7. (a) Graham goes into a shop and buys a bottle of water and a cheese roll for £1.38.

In the same shop, Alan pays £1.77 for 2 bottles of water and a cheese roll.

How much does a bottle of water cost?

- (b) Craig goes into the shop and buys 4 bottles of water and 3 cheese rolls. How much will this cost?

2

1

3

[Turn over

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2500/404

	KU	RE
Total marks		

NATIONAL
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2005

FRIDAY, 6 MAY
11.35 AM - 12.30 PM

MATHEMATICS
STANDARD GRADE
General Level
Paper 2

Fill in these boxes and read what is printed below.

Full name of centre Town

Forename(s) Surname

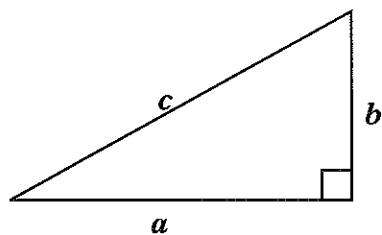
Date of birth
Day Month Year Scottish candidate number Number of seat

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FORMULAE LIST

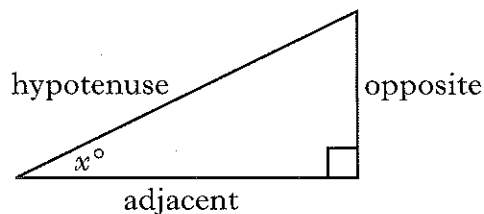
- Circumference of a circle: $C = \pi d$
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 Volume of a cylinder: $V = \pi r^2 h$
 Volume of a triangular prism: $V = Ah$

Theorem of Pythagoras:



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

Trigonometric ratios
in a right angled
triangle:

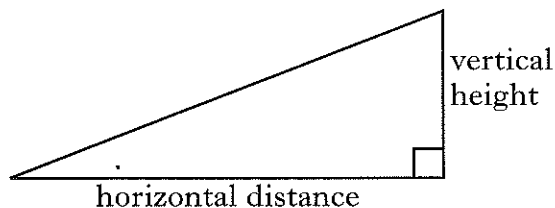


$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

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

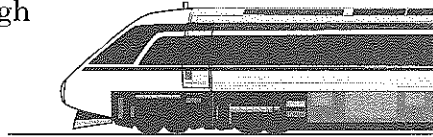
$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Gradient:



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

1. A night train from London to Edinburgh leaves at 2321 and arrives at 0651.



Marks

KU	RE

(a) How long does the train journey take?

2

- (b) The distance from London to Edinburgh is 644 kilometres.
Find the average speed of the train in kilometres per hour.
Give your answer correct to one decimal place.

3

[Turn over

3. Scott sees the following notice in the window of the Big Computer Shop.

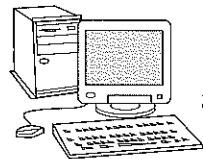
<p><i>The Big Computer Shop</i></p> <p>Massive Sale</p> <p>$33\frac{1}{3}\%$ discount</p> <p>on all purchases</p>

(a) A computer was £834.
How much would Scott pay for it in the sale?

Marks

	KU	RE
2		
3		

The same computer can be bought in Pete's PC Shop on hire purchase.

	<p>PETE'S PC SHOP</p> <p>£55 deposit and £23.33 per month for 2 years</p>
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(b) Which shop sells the computer cheaper?
Show your working.

5. (a) Remove the brackets and simplify

$$5 + 3(2x - 5).$$

- (b) Solve the inequality

$$3x - 5 \geq 13.$$

Marks

KU	RE

2

2

[Turn over

6. The sponsors of the Champions league have given £900 000 to be shared among the four competing teams.

The league table is shown below.

The teams share the money in the ratio of the **points** they gain.

How much is **United's** share of the money?

Marks

KU	RE
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	Played	Won	Lost	Drawn	Points
Inter	3	3	0	0	9
Athletic	3	2	1	0	6
United	3	1	2	0	3
Red Star	3	0	3	0	0

4

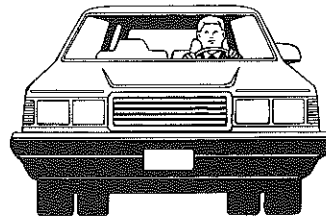
9. Serge drives from his home in Paris to Madrid, a journey of 1280 kilometres.

His car has a 60 litre petrol tank and travels 13 kilometres per litre.

Serge starts his journey with a full tank of petrol.

What is the least number of times he has to stop to refuel?

Give a reason for your answer.

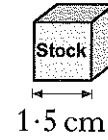


Marks

KU	RE
3	

[Turn over

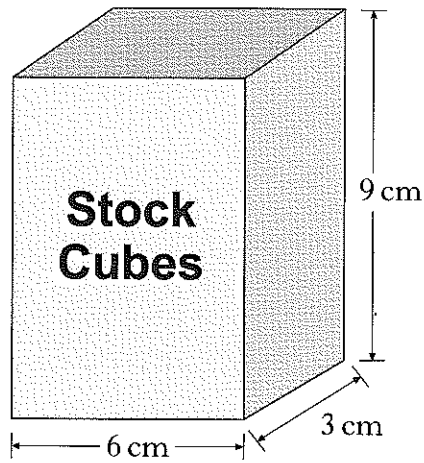
10. (a) The edge of a stock cube measures 1.5 centimetres.
Calculate the volume of the stock cube.



Marks

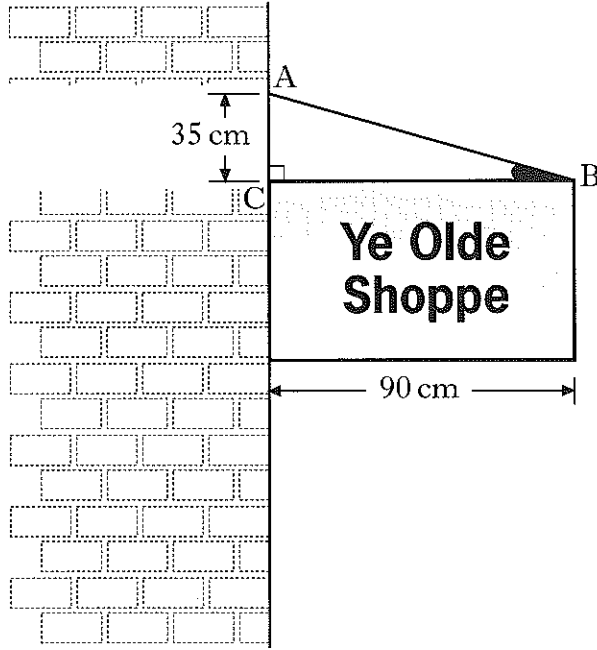
	KU	RE
1		
3		

- (b) A number of the above stock cubes are packed into a cuboid box.
The box is 6 centimetres long, 3 centimetres broad and 9 centimetres high.



How many stock cubes are needed to fill the box?

11.



Marks

KU RE

A rectangular shop sign is supported by a metal bar AB.

The length of the shop sign is 90 centimetres and the bar AB is attached to the wall 35 centimetres above the sign.

Calculate the size of the shaded angle ABC.

Do not use a scale drawing.

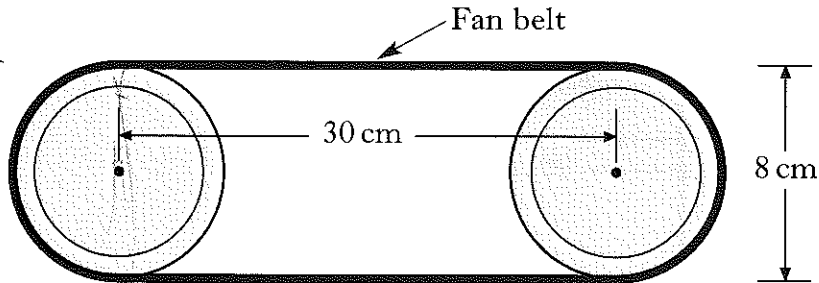
3

[Turn over for Question 12 on Page fourteen

Marks

KU	RE

12. The diagram below shows the fan belt from a machine.
The fan belt passes around 2 wheels whose centres are 30 centimetres apart.
Each wheel is 8 centimetres in diameter.



Calculate the total length of the fan belt.

4

[END OF QUESTION PAPER]