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## 2500/29/01

|  | KU | RE |
| :---: | :---: | :---: |
| Paper 1 |  |  |
| Paper 2 |  |  |
| Total |  |  |

NATIONAL QUALIFICATIONS 2012

WEDNESDAY, 2 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.
$\square$

Forename(s)


Town
$\square$
Surname


Date of birth


Scottish candidate number


Number of seat
$\qquad$

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.
5 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.


## FORMULAE LIST

Circumference of a circle:

$$
\begin{aligned}
& C=\pi d \\
& A=\pi r^{2} \\
& A=2 \pi r h \\
& V=\pi r^{2} h \\
& V=A h
\end{aligned}
$$

Area of a circle:
Curved surface area of a cylinder:
Volume of a cylinder:
Volume of a triangular prism:

Theorem of Pythagoras:


Trigonometric ratios
in a right angled
triangle:


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

Gradient:


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

1. Carry out the following calculations.
(a) $14 \cdot 6-3 \cdot 21+5 \cdot 3$

1
(b) $2.44 \times 90$

1
(c) $76 \cdot 8 \div 6$

1
(d) $\frac{1}{4}+\frac{1}{3}$
2. Top footballers can earn $£ 27 \cdot 2$ million each year. Write $27 \cdot 2$ million in scientific notation.

3. An amusement arcade has a lighting effect in the shape of triangles with coloured lights attached.

The lighting effect can be assembled in sections as shown below.


2 sections
(a) Complete the table below.

| Number of sections $(s)$ | 1 | 2 | 3 | 4 | 5 |  | 12 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Number of coloured lights $(c)$ | 6 | 11 |  |  |  |  |  |

2
(b) Write down a formula for calculating the number of coloured lights (c) when you know the number of sections $(s)$.
(c) The amusement arcade's lighting effect uses a total of 116 coloured lights.
How many sections are in the lighting effect?
4. From the numbers $50,93,43,56,85,42$ choose:
(a) two numbers which are multiples of seven;

1
(b) the prime number;

1
(c) the number which is closest to a square number.
5. A website shows some extreme temperatures recorded on Earth.

The highest temperature recorded was $58^{\circ} \mathrm{C}$ in Libya in 1922.

The lowest temperature recorded was $-64^{\circ} \mathrm{C}$ in Siberia in 1973.


Find the difference between these two temperatures.
6. Starting with the smallest, write the following in order.

$$
\begin{array}{lllll}
\frac{1}{5} & 0.05 & 51 \% & 0.505 & \frac{5}{10}
\end{array}
$$

7. Colin works in a supermarket at the weekend. He is paid the basic rate of $£ 7 \cdot 50$ per hour on Saturdays.

He is paid at time and a half on Sundays.
Last weekend he worked 7 hours on Saturday and 6 hours on Sunday.


Calculate Colin's total pay for last weekend.
8. 720 people were at The Venue on Friday.

On Friday, it was only $80 \%$ full.
On Saturday, The Venue was full.
Rock at The Venue

2 nights only

How many people were at The Venue on Saturday?
9. Jamie took the overnight sleeper train from Edinburgh to London.

She arrived in London at 0624.
Her journey had taken 6 hours 58 minutes.


When did Jamie's sleeper train leave Edinburgh?
10.


The diagram above shows a semi-circle with BD as diameter.

- C lies on the circumference
- In triangle BCD , angle CDB is $71^{\circ}$
- AD is a straight line

Calculate the size of the shaded angle ABC.

## ADDITIONAL SPACE FOR ANSWERS

$\square$

## 2500/29/02

 QUALIFICATIONS 2012

WEDNESDAY, 2 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
$\square$
Forename(s)


Town
$\square$
Surname


Date of birth


Number of seat


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1. In the Annual Fun Run, Lucy ran 12 kilometres in 1 hour 15 minutes.

Calculate her average speed in kilometres per hour.

2. John has drawn this design.


Using a scale factor of 2, draw an enlargement of John's design on the grid below.

3. Stephen is buying new kitchen cabinets.

| Kitchen Cabinet Price List | Width |  |  |
| :---: | :---: | :---: | :---: |
| Cabinets | 30 cm | 50 cm | 80 cm |
| Base | $£ 43$ | $£ 66$ | $£ 94$ |
| Wall | $£ 39$ | $£ 58$ | $£ 92$ |
| High | $£ 68$ | $£ 116$ | $£ 170$ |
| Drawer | $£ 103$ | $£ 123$ | $£ 179$ |

He buys:

- three Base cabinets of width 50 centimetres
- two Wall cabinets of width 30 centimetres
- one Drawer cabinet of width 80 centimetres.

Calculate the total cost of his kitchen cabinets.
4. Brian sets out from camp during an expedition.

The arrow in the sketch below shows the direction in which he is travelling.


What is the three-figure bearing of this direction?
5. Renvi is tiling her bathroom floor.

She needs 15 boxes of tiles.
The price of one box is $£ 23$.
The tile shop has a special offer of "buy one box get one box half price".

Renvi makes use of the special offer.


How much does Renvi pay for 15 boxes of tiles?
6. (a) Complete the table below for $y=2 x-1$.

| $x$ | -1 | 1 | 3 |
| :--- | :--- | :--- | :--- |
| $y$ |  |  |  |

(b) Using the table in part (a), draw the graph of the line $y=2 x-1$ on the grid below.

7. Maggie has bought a garden shed.

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


Calculate the length of ST.
Do not use a scale drawing.
8. The cash price of a 3 D TV at Curlys Superstore is $£ 1315$.

Curlys also has an interest free payment plan.

The payment plan is a deposit plus twelve equal monthly payments.

The deposit for the TV is $£ 175$.


Find the cost of the monthly payments.
9. (a) Solve algebraically

$$
6(2 x-3)=42 .
$$

(b) Factorise

$$
12 t+9 u
$$

2
[Turn over
10. At the World Athletic Championships the mean time for the first semi-final of the 100 metres was 9.98 seconds.


For the second semi-final the times, in seconds, were:
$\begin{array}{llllllll}10.21 & 10.04 & 9.92 & 9.98 & 10.04 & 9.94 & 9.9 & 9.73 .\end{array}$

Was the mean time for the second semi-final better than the mean time for the first semi-final?

Give a reason for your answer.
11. The pupils in fourth year at Wanlockhead High School voted in the school election.

The votes for each candidate are given below:
Eco: 86 votes
Health: 24 votes
Fairtrade: 52 votes
Community: 18 votes
Using a suitable scale, draw a bar chart to show this information.


Candidate
12. The Olympic symbol consists of five identical circles.

Part of the symbol is shown in the diagram below.


- the length of the symbol is 45 centimetres
- the circles are equally spaced
- the gap between the adjacent circles is 1.5 centimetres.


Calculate the radius of a circle.
13. A surveyor has to calculate the height of a mobile phone mast.

From a point 20 metres from the base of the mast, the angle of elevation to the top is $52^{\circ}$.

Calculate the height of the mobile phone mast.

Round your answer to 1 decimal place.
Do not use a scale drawing.
14. Pachuri Sauces are changing the shape of the labels on their jars from circles to squares.

The labels have the same area.
The circle has a radius of 4.5 centimetres.


Calculate the length of the new square label.

## ADDITIONAL SPACE FOR ANSWERS

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