$\square$

Total marks

## 2500/403



NATIONAL QUALIFICATIONS 2007

THURSDAY, 3 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


Forename(s)


Town


Surname


Date of birth


Scottish candidate number


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.

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## FORMULAE LIST

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

Theorem of Pythagoras:


Trigonometric ratios in a right angled triangle:

$$
\begin{aligned}
& \boldsymbol{\operatorname { t a n }} x^{\circ}=\frac{\text { opposite }}{\text { adjacent }} \\
& \sin x^{\circ}=\frac{\text { opposite }}{\text { hypotenuse }} \\
& \boldsymbol{\operatorname { c o s }} x^{\circ}=\frac{\text { adjacent }}{\text { hypotenuse }}
\end{aligned}
$$

Gradient:


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

1. Carry out the following calculations.
(a) $4.27-1.832$
(b) $6.53 \times 40$

1
(c) $372 \div 8$
(d) $5 \times 4 \frac{1}{3}$
2. A particle is radioactive for $2.3 \times 10^{-4}$ seconds.

Write this number in full.
3. Zoe is a member of a gym.

The gym offers the following exercise sessions.

| Exercise | Session Time |
| :--- | :---: |
| Weights | 15 minutes |
| Dance | 40 minutes |
| Running | 20 minutes |
| Cycling | 30 minutes |
| Swimming | 45 minutes |

Zoe is advised to choose three different exercises.
She wants to exercise for a minimum of $\mathbf{9 0}$ minutes.
One possible combination of three different exercises is shown in the table below.

Complete the table to show all the possible combinations of three different exercises Zoe can choose.

| Weights | Dance | Running | Cycling | Swimming | Total Time <br> (minutes) |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  |  | $\checkmark$ | $\checkmark$ | $\checkmark$ | 95 minutes |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

3
4. Complete this shape so that it has quarter-turn symmetry about O .

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

[Turn over
5. In an experiment Rashid measures the temperature of two liquids.


The temperature of the first liquid is $-11^{\circ}$ Celsius.
The temperature of the second liquid is $23^{\circ}$ Celsius.
Find the difference between these temperatures.
6. A children's play area is to be fenced.

The fence is made in sections using lengths of wood, as shown below.


## 3 sections

(a) Complete the table below.

| Number of sections $(s)$ | 1 | 2 | 3 | 4 | 5 |  | 12 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Number of lengths of wood $(w)$ | 6 | 11 |  |  |  |  |  |

2
(b) Write down a formula for calculating the number of lengths of wood (w), when you know the number of sections ( $s$ ).
(c) A fence has been made from 81 lengths of wood.

How many sections are in this fence?

## You must show your working.

7. The table below shows the marks scored by pupils in French and Italian exams.

| Pupil | A | B | C | D | E | F | G | H |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| French Mark | 15 | 23 | 50 | 38 | 40 | 42 | 70 | 82 |
| Italian Mark | 28 | 31 | 62 | 54 | 45 | 55 | 85 | 95 |

(a) Using these marks, draw a scattergraph.

(b) Draw a best-fitting line on the graph.
(c) A pupil who scored 65 in his French exam was absent from the Italian exam.

Use your best-fitting line to estimate this pupil's Italian mark.
8. Pamela sees a bracelet costing $£ 65$ in a jeweller's window. The jeweller offers Pamela a 5\% discount. Pamela decides to buy the bracelet. How much does she pay?

9. Craig works in the school office.

Shown below is his order for 25 boxes of folders.

| Office Supplies |  |
| :--- | ---: |
| Blue Folders | 7 boxes |
| Green Folders | 11 boxes |
| Pink Folders | 3 boxes |
| Yellow Folders | 4 boxes |
| Total | $\mathbf{2 5}$ boxes |

His order has arrived in identical boxes but they are not labelled.
(a) What is the probability that the first box Craig opens contains pink folders?
(b) The first box Craig opens contains green folders.

What is the probability that the next box he opens contains blue folders?
10. There are 720 pupils in Laggan High School.

The ratio of boys to girls in the school is $5: 4$.
How many girls are in the school?

## ADDITIONAL SPACE FOR ANSWERS

$\square$

Total marks

## 2500/404



NATIONAL
QUALIFICATIONS 2007

THURSDAY, 3 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


Forename(s)


Town


Surname


Date of birth


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Theorem of Pythagoras:


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1. A Sprinter train travels at an average speed of 144 kilometres per hour.

The train takes 1 hour 15 minutes to travel between Dingwall and Aberdeen.

Calculate the distance between Dingwall and Aberdeen.


Marks

| KU | RE |
| :--- | :--- |

2. Mr McGill is a bricklayer.

He builds a wall using 7500 bricks:

- each brick costs 23 pence
- a charge of $£ 200$ is made for every 500 bricks he lays.

What is the total cost of building the wall?
3.

## Belmont Vets Check-up Fees



| Dog | $£ 17.50$ |
| :--- | ---: |
| Cat | $£ 11.75$ |
| Rabbit | $£ 7.95$ |

The Wilson family owns two dogs and a cat.
Last year each dog had two check-ups at Belmont Vets.
The family cat also had check-ups last year.
The Wilson's total check-up fees for the two dogs and the cat were $£ 105 \cdot 25$. How often did the cat have a check-up?
4. A rectangular metal grill for a window is shown below.

Two diagonal metal bars strengthen the grill.


Find the length of one of the metal bars.
Round your answer to the nearest centimetre.
Do not use a scale drawing.

$$
\begin{aligned}
& \text { 5. (a) Simplify } \\
& \qquad 2(3 x+7)+4(3-x) .
\end{aligned}
$$

(b) Solve the inequality

$$
4 a-3 \geq 21
$$

6. DEFG is a kite:

- angle $\mathrm{DEG}=35^{\circ}$
- $\mathrm{EF}=14$ centimetres.


Marks

| MARGIN |  |
| :--- | :---: |
| KU | RE |
|  |  |

7. A supermarket has a canopy over its entrance.


The edge of the canopy has 6 semicircles as shown below.


Each semicircle has a diameter of 4 metres.
(a) Find the length of the curved edge of one of the semicircles.
(b) Tony attaches fairy lights to the edge of the canopy.


He has 40 metres of fairy lights.
Is this enough for the whole canopy?
Give a reason for your answer.

Sally invests $£ 4200$ in the Platinum Saver Account which pays $6 \cdot 3 \%$ interest per annum.
How much simple interest will she receive after 10 months?

- $O$ is the centre of the circle
- AC is a diameter
- $B$ is a point on the circumference
- angle $\mathrm{BAC}=43^{\circ}$.

Calculate the size of shaded angle BOC.

(a) Calculate the area of the end face.
10. The end face of a grain hopper is shown in the diagram.
(a) Calculate the area of the end


3
(b) The grain hopper is in the shape of a prism with a length of 3.5 metres. Find the volume of the hopper.


|  |  |
| :--- | :--- |
|  |  |
|  |  |

11. The diagram below shows the design for a house window.


Marks
MARGIN

| KU | RE |
| :--- | :--- |
|  |  |
|  |  |

Find the value of $x$.
12. The burning time, $t$ minutes, of a candle varies directly as its height, $h$ millimetres.
A candle with a height of 75 millimetres burns for 180 minutes.
(a) What is the burning time of a 40 millimetre candle?
(b) A candle burns for $2 \frac{1}{2}$ hours.

What is the height of this candle?

## ADDITIONAL SPACE FOR ANSWERS

## ADDITIONAL SPACE FOR ANSWERS

