Coser
Rewarding Learning

## General Certificate of Secondary Education

 2009Mathematics


Module N3 Paper 2
(With calculator)
Higher Tier
[GMN32]
MONDAY 18 MAY
$2.45 \mathrm{pm}-3.45 \mathrm{pm}$

## TIME

1 hour.

## INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer all twelve questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

## INFORMATION FOR CANDIDATES

The total mark for this paper is 44 .
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

| For Examiner's <br> use only |  |
| :---: | :---: |
| Question <br> Number | Marks |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| 11 |  |
| 12 |  |
| Total <br> Marks |  |

## Formula Sheet

Area of trapezium $=\frac{1}{2}(a+b) h$


Volume of prism $=$ area of cross section $\times$ length


In any triangle $A B C$
Area of triangle $=\frac{1}{2} a b \sin C$
Sine rule : $\quad \frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C}$
Cosine rule: $a^{2}=b^{2}+c^{2}-2 b c \cos A$


Volume of sphere $=\frac{4}{3} \pi r^{3}$
Surface area of sphere $=4 \pi r^{2}$


Volume of cone $=\frac{1}{3} \pi r^{2} h$
Curved surface area of cone $=\pi r l$


## Quadratic equation:

The solutions of $a x^{2}+b x+c=0$, where $a \neq 0$, are given by

$$
x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 a}
$$



A is the point $(-2,4) . B$ is the point $(3,-6)$.
Find the midpoint of AB .
Answer ( $\qquad$ , $\qquad$

2 The heights (in centimetres) of twenty boys in a local hockey club are:

$$
\begin{array}{llllllllll}
181 & 170 & 162 & 153 & 182 & 171 & 163 & 158 & 185 & 174 \\
166 & 157 & 177 & 167 & 178 & 167 & 178 & 167 & 169 & 168
\end{array}
$$

Construct a stem and leaf diagram to illustrate these heights.

3 A wardrobe is priced at $£ 640$
In a sale its price was reduced by $35 \%$.
Calculate the sale price of the wardrobe.

Answer $£$ [3]

4 Construct a rhombus of side 6.5 cm which has one of its diagonals 5 cm in length.

## [4]

5 Katy wants to know how many times a month, on average, the people in her town go to the cinema. She asks 200 pupils in her school.

Explain why Katy's sample may not be representative of the people in her town.

Answer $\qquad$
$\qquad$

6 (a) Expand and simplify $4(2 a+3)-7$

Answer
(b) Factorise
(i) $6 a-10$

Answer $\qquad$
(ii) $a^{2}+a$

Answer $\qquad$

7 A man is filling his garden pond with water. He can fill a bucket of water and empty it into the pond every 25 seconds.
The bucket holds 15 litres of water.
It takes the man 4 minutes and 35 seconds to fill the pond.
What volume of water does the pond hold?

Answer $\qquad$ [4]

8 Use trial and improvement to solve $x^{3}-2 x=41$ giving the answer correct to 1 decimal place.

## Show your working.

$\qquad$ [4]
$9 £ 2500$ is placed in a bank account and gains $4 \%$ compound interest per
$\qquad$

(a) Calculate the length of BC in the right-angled triangle.

Answer $\qquad$ cm [3]
(b) Calculate the size of angle BAC.

Answer $\qquad$ ${ }^{\circ}$ [3]

11 The number of trees undamaged in an orchard after a hurricane was 220.
It was observed that $12 \%$ had been damaged.
How many trees were in the orchard before the hurricane?

Answer $\qquad$ [3]

12 Peter is a gardener. He recorded how much money he made each week for 40 weeks.

| Money in $\mathfrak{£}(\boldsymbol{m})$ | Frequency | Money in $\mathfrak{f}$ | Cumulative frequency |
| :---: | :---: | :---: | :---: |
| $180 \leqslant m<200$ | 4 | $<200$ | 4 |
| $200 \leqslant m<220$ | 7 | $<220$ | 11 |
| $220 \leqslant m<240$ | 12 | $<240$ |  |
| $240 \leqslant m<260$ | 9 |  |  |
| $260 \leqslant m<280$ | 5 |  |  |
| $280 \leqslant m<300$ | 2 |  |  |
| $300 \leqslant m<320$ | 1 |  |  |

(a) Complete the table.
(b) Draw the cumulative frequency graph on the opposite page.
(c) Use the graph to estimate
(i) the median,

Answer $£$ $\qquad$
(ii) the inter-quartile range.

Answer £


## THIS IS THE END OF THE QUESTION PAPER

