FORM 2 MATHEMATICS SCHEME B TIME: 30 minutes
Non-Calculator Paper

Name: _____________________________________ Class: _______________

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark</td>
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</table>

Instructions to Candidates

- Answer all questions.
- This paper carries a total of 25 marks.
- Calculators and protractors are not allowed.
1. Which of the following is the nearest answer to: \(\frac{23.2 \times 19.64}{3.65}\)?

   (a) 0.1  (b) 1  (c) 10  (d) 100  (e) 1000  

__________ (1 mark)

2. Fill in with the unit which best describes the following:

   (i) A bottle of mineral water holds 2 ____. (cm, cm\(^2\), cm\(^3\), ℓ, ml)

   (ii) The area of a football pitch is 1700 ____. (m, m\(^2\), cm, cm\(^2\), km\(^2\))

__________ (2 marks)

3. (a) Michael got 32 marks out of 50 in his geography test. What percentage is this?

   _______ %

   (b) Write these fractions in order, smallest first:

   \(\frac{2}{3}, \frac{1}{2}, \frac{1}{4}\)

   ______ , ______, ______

   (c) Express 240 as a product of its prime factors.

   ___________________

   (d) Find the HCF of 30 and 45.

   __________________

   (5 marks)
4. (a) Find the value of $x$, $y$ and $z$.

\[x = \_, \quad y = \_, \quad z = \_\]

(b) Divide €24 in the ratio of 1:3.

\[
\_, \quad \_
\]

(5 marks)

5.

Fill in:

\[
\angle A + \angle B + \angle C + \angle D + \angle E + \angle F = \_\]

(1 mark)
6. Brian records how long he takes to run round the school track.

<table>
<thead>
<tr>
<th></th>
<th>1st run</th>
<th>2nd run</th>
<th>3rd run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>5 mins</td>
<td>4 mins 55 sec</td>
<td>4 mins 45 sec</td>
</tr>
</tbody>
</table>

What is the range of Brian’s times?

_______

(2 marks)

7. (a) 

-20°C

Freezer A  

-18°C

Freezer B  

Refrigerator

(i) Which freezer is colder? _______

(ii) What is the difference in the temperatures between the two freezers?

_______ °C

(iii) The temperature of the refrigerator is 30°C higher than that of Freezer A.

What is the temperature of the refrigerator?

_______ °C

(b) Find the value of \( r + q^2 \) when \( r = 2 \) and \( q = -3 \).

_______

(5 marks)
8. Roland wants to fit the **largest number of cubes** of side 2 cm into the big box.

(a) How many cubes he must use to cover completely the **base** of the box?

_______ cubes

(b) What is the **largest number of whole cubes** that he can fit in the box?

_______ cubes

9. A stamp costs 19c. How many stamps can I buy with €1?

_______ stamps

10. ABCD is a parallelogram.

Fill in using a fraction:

Area of triangle AXB = _______ Area of parallelogram ABCD

_______ (1 mark)
Name: _____________________________________ Class: _______________

- Answer all questions.
- This paper carries 75 marks.
- Calculators and mathematical instruments are allowed but all necessary working must be shown.

1. (a) This figure is a _____________________.
   (trapezium, square, hexagon, cuboid, rhombus, kite)

   (b) Fill in:
   
   (i) The shape is __________ (regular, irregular, perpendicular).

   (ii) It has _____ lines of symmetry.

   (iii) It has rotational symmetry of order _____.

   (3 marks)

2. (a) Change the units:

   (i) Write 6 kg 200 g in kilograms. _________

   (ii) Write 8 h 30 mins in hours. _________

   (b) Find the total cost of 20ℓ and 400 ml of petrol at 90 cent per litre.

   _________

   (4 marks)
3. (a) Fill in the spaces of the sequences.
   (i) 15, 21, 27, ____, 39.
   (ii) $\frac{1}{6}$, $\frac{3}{5}$, $\frac{5}{4}$, $\frac{7}{3}$, ____
   (iii) 2, 6, 18, 54, ____

(b) Underline the TWO statements which are **FALSE**:
   (i) 5 is a prime number.
   (ii) 5 > 0.
   (iii) 5 is a factor of 50.
   (iv) 5 is a multiple of 15.
   (v) 5 is twice $\frac{1}{2}$
   (vi) 5 is 15% of 20.

(5 marks)

4. (a) What number is shown marked by an arrow on the number line? $N = \underline{\phantom{00}}$

(b) (i) Write as **decimals**:
   $0.511 \times 100$  $\frac{12}{25}$  $\frac{300}{800}$  $0.82 \div 10$

   _______    _______    _______    _______

   (ii) Put in order of size, **smallest** first.

   _______    _______    _______    _______

   (c) Work out: $1\frac{3}{4} - \frac{5}{6}$

   ______
5. (a) The diagram is part of a spreadsheet showing Monica’s marks in five Mathematics tests.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>82</td>
</tr>
<tr>
<td>3</td>
<td>83</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>6</td>
<td>mean</td>
</tr>
</tbody>
</table>

(i) Which formula should Monica write in cell A6 to find the mean mark?

\[ \text{Mean mark: } \frac{(A1 + A5)}{5} \]
\[ = \text{SUM A1 : A5}/5 \]
\[ = \text{SUM (A1: A5)}/5 \]

(ii) What is her mean mark?

Mean mark: ______

(iii) What is her median mark?

Median mark: ______

(b) Fill in the missing LOGO command to draw the triangle below.
(t.s. stands for turtle steps)

PD LT 90 FD 80 ____ ____ FD 60 HOME (5 marks)

6. (a) Which of the following is equal to \(3a\)?

\[ a + a + a \] \[ 3 + a \] \[ a \times a \times a \]

(b) Simplify:

\[ 2h - 4 + 3h + 7 = \] (5 marks)

(c) Expand the brackets:

\[ 8(3r - 1) = \] (5 marks)
7. One day Paul records the ages of the people entering a gymnasium.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>29</td>
<td>22</td>
<td>28</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>38</td>
<td>31</td>
<td>28</td>
<td>24</td>
<td>26</td>
<td>29</td>
</tr>
</tbody>
</table>

(a) Complete Paul’s frequency table from the given data.

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>Frequency</th>
<th>Angle in Pie</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least</td>
<td>Below</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>360º</td>
</tr>
</tbody>
</table>

(b) What is the **probability** that a person entering the gym is **older** than 24 years?

(c) Complete and **label** the pie chart.

(6 marks)
8. (a) Solve
   (i) \( \frac{x}{4} = 12 \)

   \[ x = \underline{\quad} \]

   (ii) \( 6k - 1 = 29 \)

   \[ k = \underline{\quad} \]

   (b) (i) Write and simplify an expression for the perimeter, \( P \), of the triangle.

   \[ P = \underline{\quad} \]

   (ii) Work out the value of \( x \) when the \( P = 22 \) cm.

   \[ x = \underline{\quad} \text{ cm} \]

   (8 marks)

9. (a) Mr Abela makes this scale drawing to show a plot of land.

   (i) The length of AB is \( \underline{\quad} \) cm

   (ii) The \textbf{real} length of the plot of land is \( \underline{\quad} \) m

[Diagram of a rectangle with scale 1 cm : 2 m.]

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9. (b) In this question all construction lines must be shown. 

Use ruler and compasses only.

(i) On the given line, mark point C such that BC = 8 cm.

(ii) Construct and label triangle ABC such that angle B = 90º and AB = 6 cm.

(iii) Measure AC and give the answer correct to the nearest mm.

\[ AC = \underline{\hspace{2cm}} \]

(iv) Calculate the area of triangle ABC.

\[ \text{Area of } \triangle ABC = \underline{\hspace{2cm}} \]

(9 marks)
10. The graph shows Kyle’s journey last school holiday.

He walks from home to the bus stop and then takes the bus to the gymnasium and travels back home again.

(a) How far from home is the bus stop?

(b) How long does Kyle stay at the gym?

(c) Which is the fastest part of the journey: P, Q, R, S or T?
Explain.

(4 marks)
11. (a) Complete the table for the straight line graph of $y = 3x - 4$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$-1$</th>
<th>$0$</th>
<th>$2$</th>
<th>$4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3x$</td>
<td>$-3$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$-4$</td>
<td>$-4$</td>
<td>$-4$</td>
<td>$-4$</td>
<td>$-4$</td>
</tr>
<tr>
<td>$y$</td>
<td>$-7$</td>
<td>$2$</td>
<td>$8$</td>
<td></td>
</tr>
</tbody>
</table>

(b) Draw the graph $y = 3x - 4$.

(c) Use your graph to find the value of $y$ when $x = 3$.

$y = \underline{\phantom{0000}}$  

(8 marks)
12. **Choose** your answers from the table below to describe **fully** the transformation which maps:

(a) the shaded flag onto flag $P$.
\[
\begin{array}{c}
\text{Translation} \\
\text{Rotation} \\
\text{Reflection} \\
\text{4 right} \\
in y \text{ axis}
\end{array}
\begin{array}{c}
\text{about origin} \\
4 \text{ left} \\
90^\circ \text{ clockwise} \\
90^\circ \text{ anti clockwise} \\
6 \text{ down}
\end{array}
\]

(b) the shaded flag onto flag $Q$.
\[
\begin{array}{c}
\text{Translation} \\
\text{Rotation} \\
\text{Reflection} \\
\text{4 right} \\
in y \text{ axis}
\end{array}
\begin{array}{c}
\text{about origin} \\
4 \text{ left} \\
90^\circ \text{ clockwise} \\
90^\circ \text{ anti clockwise} \\
6 \text{ down}
\end{array}
\]

(c) the shaded flag onto flag $R$.
\[
\begin{array}{c}
\text{Translation} \\
\text{Rotation} \\
\text{Reflection} \\
\text{4 right} \\
in y \text{ axis}
\end{array}
\begin{array}{c}
\text{about origin} \\
4 \text{ left} \\
90^\circ \text{ clockwise} \\
90^\circ \text{ anti clockwise} \\
6 \text{ down}
\end{array}
\]

13. (a) (i) What is the bearing of $Q$ from $P$?
\[
\text{______}
\]

(ii) **Mark** point $R$ on the diagram such that $R$ is on a bearing of $045^\circ$ from $Q$.

(b) (i) Find the size of the angle marked $g$.
\[
g = \text{______}^\circ \quad \text{Reason: ____________________}
\]

(ii) When $k = g$ which 2 sides of triangle $ABC$ must be equal?
\[
\text{______} = \text{______}
\]

(iii) Find the size of the angle marked $h$ when $k = g$.
\[
h = \text{______}^\circ \quad \text{Reason: ____________________}
\]

**END OF PAPER**