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: \( \frac{23.2 \times 19.64}{\sqrt{16.3}} \)?

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

   (1 mark)

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

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

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

   (2 marks)

3. (a) Michael got 48 marks out of 80 in his geography test. What percentage is this?

   (b) Write a fraction that lies between \( \frac{1}{2} \) and \( \frac{5}{6} \).

   (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 $x$.

\[ x + 2 \quad 100^\circ \]

\[ x = \ldots \]

(b) (i) Write the ratio of the size of the angle marked $q$ to that marked $r$.
Simplify the answer.

\[ \ldots : \ldots \]

(ii) Divide a wire 4.5 m long in the ratio of 2 : 3.

\[ \ldots \quad \ldots \]

(5 marks)

5.

Fill in:

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

(1 mark)
6. Brian and Helga record how long they take to run round the school track.

<table>
<thead>
<tr>
<th>Brian’s data</th>
<th>Helga’s data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st run</strong></td>
<td>1st run</td>
</tr>
<tr>
<td><strong>2nd run</strong></td>
<td>2nd run</td>
</tr>
<tr>
<td><strong>3rd run</strong></td>
<td>3rd run</td>
</tr>
<tr>
<td>5 mins</td>
<td>4 mins 30 sec</td>
</tr>
<tr>
<td>4 mins 55 sec</td>
<td>4 mins 20 sec</td>
</tr>
<tr>
<td>4 mins 45 sec</td>
<td>4 mins 10 sec</td>
</tr>
</tbody>
</table>

a) Work out the range of the times of both children.

Brian’s range _________
Helga’s range _________

b) Helga says, “My running times have improved more than Brian’s.”
Is she right? Explain.

___________________________________________________ _______________________
___________________________________________________ _______________________

(3 marks)

7. (a) 

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

_______ °C

(ii) 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 \( q = -3 \).

8. Roland wants to fit the largest number of cubes of side 2 cm into the box which measures 8 cm by 6 cm by 7 cm.

What is the largest number of whole cubes that he can fit?

9. How many \( 2 \frac{1}{2} \ell \) bottles can be filled from a jug containing 7.5 \ell of water?
10.

ABCD is a parallelogram.

Fill in using a fraction:

$$\text{Area of triangle AXB} = \frac{\text{_____}}{\text{Area of parallelogram ABCD}}$$

(1 mark)

END OF PAPER
DO NOT WRITE ABOVE THIS LINE

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) Write down the name of the parallelogram having
   (i) equal sides and (ii) rotational symmetry of order 2.
   (square, rectangle, rhombus, kite) _______________

(b) The scores of two spinners are added.
   (i) Complete the probability space.
   (ii) What is the probability that the total score is a square number?

   1st spinner
   0 1 2 3
   2 2 3 4 5
   4 4
   6

   2nd spinner

   (3 marks)

2. (a) Change the units:
   (ii) Write 6 kg 20 g in kilograms. __________
   (ii) Write 8 h 15 mins in hours. __________

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

    (3 marks)
3. (a) Find the value of A, B, C and D in the following pattern:

\[
\begin{align*}
2 & \quad \rightarrow \quad 4 \quad \rightarrow \quad B \quad \rightarrow \quad 10 \\
4 & \quad \rightarrow \quad 8 \quad \rightarrow \quad 18 \quad \rightarrow \quad 26 \\
8 & \quad \rightarrow \quad 16 \quad \rightarrow \quad 54 \quad \rightarrow \quad 70 \\
A & \quad \rightarrow \quad \rightarrow \quad C \quad \rightarrow \quad \rightarrow \quad D
\end{align*}
\]

\[
\begin{align*}
A &= \underline{\quad} \quad B &= \underline{\quad} \\
C &= \underline{\quad} \quad D &= \underline{\quad}
\end{align*}
\]

(b) Underline the **TWO** statements which are **FALSE**:

(ii) 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 2 1/2                   (vi) 5 is 15% of 20.

(5 marks)

4. (a)

\[
\begin{align*}
N & \quad \rightarrow \quad \rightarrow \\
0.03 & \quad 0.04 \quad 0.05
\end{align*}
\]

What number is shown marked by an arrow on the number line?  \( N = \underline{\quad} \)

(b) (i) Write as decimals:

\[
0.511 \times 100, \quad \frac{12}{25}, \quad \frac{300}{800}, \quad 0.82 \div 10
\]

\[
\underline{\quad}, \quad \underline{\quad}, \quad \underline{\quad}, \quad \underline{\quad}
\]

(ii) Put in ascending order of size.

\[
\underline{\quad}, \quad \underline{\quad}, \quad \underline{\quad}, \quad \underline{\quad}
\]

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

\[
\underline{\quad}
\]

(4 marks)
5. (a) The diagram is part of a spreadsheet that shows Monica’s marks in five Mathematics tests.

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

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

- \( \frac{A1 + A5}{5} \)
- \( \frac{\text{SUM A1 : A5}}{5} \)
- \( \frac{\text{SUM (A1: A5)}}{5} \)

(ii) What is her mean mark?

Mean mark: __________

(iii) What is her median mark?

Median mark: ________

(iv) After doing another test, Monica increases her mean mark by 1. How much did she get in her 6th test?

(b) Fill in the missing LOGO command to draw the isosceles triangle below.

(t.s. stands for turtle steps)

\[ \text{PD LT 90 FD 40 } ____ \quad ____ \text{FD 60 HOME} \]

(6 marks)

6. (a) Which of the following is equal to \( 3a^2 \)?

- \( 3 + a + a \)
- \( 3a + a \)
- \( 3 \times a \times a \)

(b) Simplify:

\[ 3(h + j) - (h - j) = \]

(c) Factorise completely:

\[ 18g - 27 = \]

(5 marks)
7. One day Paul records the ages of the people entering a gymnasium.

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>Frequency</th>
<th>Angle in Pie Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 &lt; x ≤ 25</td>
<td>4</td>
<td>120º</td>
</tr>
<tr>
<td>25 &lt; x ≤ 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 &lt; x ≤ 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 &lt; x ≤ 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>360º</td>
</tr>
</tbody>
</table>

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

(b) How many persons entering the gymnasium are older than 25 years?

(c) Complete and label the pie chart.
8. (a) A tin of baked beans weighs $q$ grams.
   (i) What is the weight in grams of $N$ similar tins?
       ___________ grams
   A box weighs $P$ grams when empty.
   (ii) Write down the formula for $W$ when $W$ grams is the weight of the box filled with $N$ tins.
        $W =$ ________________
   (iii) The full box weighs 10 kg, the empty box weighs 1 kg and each tin weighs 200 grams.
        Use your formula to find the number of tins that are in a full box.
        ___________ tins

(b) Solve: $4 - 2(x - 3) = 8$

   $x =$ ___________

(8 marks)

9. (a) Andrew makes this scale drawing to find the height of a building, TB.

   (i) On the scale drawing, the angle of elevation of the top of the building from point A, is 25º.
       What is the actual angle of elevation?
       ___________

   (ii) By measuring TB, work out the actual height of the building.
       ___________
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 CA = 10 cm.

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

\[ AB = \underline{} \]

(iv) Calculate the area of triangle ABC.

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

(9 marks)
10. The graph shows Kyle’s journey last school holiday. He walked from home to the bus stop and then took the bus to the gymnasium. After his session he returned home.

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

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

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

Which was the fastest part of the journey: P, Q, R, S or T? Explain.
11. (a) Complete the table for the straight line graph \( y = 3x - 4 \).

<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></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

(b) Draw the graph \( y = 3x - 4 \). Label the axes.
(c) What is the gradient of the graph? 

(d) Find the value of $y$ when $x = 3$. 

(e) Which of the following lines is parallel to the line $y = 3x - 4$?

$y = 3x + 6$  $y = x - 4$  $y = 4x - 3$ 

Choose your answers from the table below to describe fully the transformation which maps:

a) the shaded flag onto flag $P$. 

b) the shaded flag onto flag $Q$. 

c) the shaded flag onto flag $R$. 

<table>
<thead>
<tr>
<th>Translation</th>
<th>Rotation</th>
<th>Reflection</th>
<th>6 right</th>
<th>in line $x = 4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>about origin</td>
<td>4 left</td>
<td>$90^\circ$ clockwise</td>
<td>$90^\circ$ anticlockwise</td>
<td>1 down</td>
</tr>
</tbody>
</table>
13. (a) 

(i) What is the bearing of Q from P?

__________________

(ii) Mark point R on the diagram such that R is on a bearing of 045º from Q.

(b) 

(i) Find the size of the angle marked $g$.

$g = \underline{\hspace{1cm}}$º Reason: ____________________

(ii) Find the size of the angle marked $h$.

$h = \underline{\hspace{1cm}}$º Reason: ____________________