DO NOT WRITE ABOVE THIS LINE.

Name: _______________________________  Class: ____________

Instructions to Candidates

- Answer all questions.
- This paper carries a total of 25 marks.
- Calculators and protractors are NOT ALLOWED.
1. Find the value of: $17 - 2 \times (3 + 4)$.

(2 marks)

2. a) i) Write down the factors of 8. Ans: _______________________

ii) Write down the factors of 20. Ans: _______________________

b) Find the Highest Common Factor (HCF) of 8 and 20.

Ans: __________

(3 marks)

3. What number is halfway between $-3$ and 5?

Ans: __________

(1 mark)

4. Estimate the value of the marked angle. Choose the correct answer from:

A) 160° B) 190° C) 220° D) 280° E) 310°.

Ans: __________

(1 mark)

5. In a dancing competition, a dancer obtained the following points:

5, 10, 5, 5, 3, 7, 9, 8.

What is the mean of the points obtained?

Ans: __________

(2 marks)
6. PQRS is a rectangle where PS = 9 cm and SR = 5 cm.
   a) What is the area of the rectangle?

   Ans: ___________cm²

   b) What is the area of triangle PQS?

   Ans: ___________cm²

   (3 marks)

7. 

Every tile has a letter or number written. Moving to the right is positive (+) while moving to the left is negative (−). Fill in the blanks *(the first one is done for you)*:

a) Start on 0 and move by −5. You end on tile E.

b) Start on 3 and move by +2. You end on tile .

c) Start on 3 and move by −7. You end on tile .

d) If you move by −3 twice, you should move by −3 × = tiles.

e) Start on A and move by −3 twice, then move by +5. You end on tile .

(5 marks)
8. The number **196** can be written as $2 \times 2 \times 7 \times 7$. Use this information to explain that 196 is a **square** number.

_________________________________________________________________________
_________________________________________________________________________

(1 mark)

9. Simplify: $3(2a - 5) - 4$.

Ans: ___________________ 

(2 marks)

10. a) Bottle A contains 210 ml of medicine. Kurt has to finish the medicine in 7 days by taking an equal amount everyday. How many millilitres of medicine should Kurt take everyday?

Ans: _________ ml 

b) Bottle B contains $\frac{1}{5}$ litre of medicine. Dorothy takes equal amounts of this medicine 2 times a day and finishes it in 4 days. What is the amount Dorothy takes each time? (Give your answer as a fraction of a litre.)

Ans: _________ litre 

(5 marks)

END OF PAPER
1. The line ACX represents the wall of a field. Karla sets up the fences AB and BC, forming a triangle ABC. Find, by giving reasons:

   a) \( \angle BCA \)
      
      Ans: __________
      
      Reason: ________________________________________________

   b) the **acute** angle CBA
      
      Ans: _______  Reason: _________________________________________

   c) the **reflex** angle CBA
      
      Ans: _______  Reason: _________________________________________

(6 marks)
2. a) i) Write down the value indicated by the arrows A, B and C below.

\[ \text{Ans: A = } \underline{\quad} \]

\[ \text{Ans: B = } \underline{\quad} \]

\[ \text{Ans: C = } \underline{\quad} \]

ii) A, B and C below represent the values indicated by the arrows on the rulers above. Choose from the symbols \(<\), \(>\) or \(=\) to fill in the spaces. \((\text{Symbols may be used more than once.})\)

\[ \begin{array}{cc}
A & B \\
B & C \\
A & C \\
\end{array} \]

b) In a sale, 7 face towels cost €3. Fill in the missing spaces below to show the price of 1 face towel:

i) as a fraction

\[ \text{€ } \underline{\quad} \]

ii) as a decimal (correct to the nearest cent)

\[ \text{€ } \underline{\quad} \cdot \underline{\quad} \]

(7 marks)
3. In an election, group ‘Pearl’ obtains 100 votes, group ‘Topaz’ obtains 60 votes and group ‘Opal’ obtains 40 votes.
   
   a) Katia says that the ratio Pearl to Topaz to Opal votes can be simplified to $5 : 3 : 2$. Write down your workings to show that Katia is right.
   
   b) Students are elected from each group according to the ratio of votes obtained. In all, 30 students are elected. How many students are elected from the group ‘Opal’?

   Ans: _______ students
   (4 marks)

4. a) What is the common factor of 9 and 15?

   Ans: _______

   b) Work out the LCM of 12 and 15.

   Ans: _______

   c) One of the following expressions is not equivalent to the rest. State which is the one and explain why.

   
   \[
   \begin{align*}
   A & : 2(3a + 5) \\
   B & : 6(a + 3) - 8 \\
   C & : 3(2a + 3) \\
   D & : 4a + 4 + 2a + 6
   \end{align*}
   \]

   (6 marks)
5. a) Find the gradient of this straight line.

Ans: _______

b) What is the y-intercept?

Ans: _______

c) Write down the equation of this straight line.

Ans: ___________________

(5 marks)

6. a) i) Reflect triangle X in the y-axis. Label the image A.

ii) Rotate triangle X 90° anticlockwise about the point (5, 4). Label the image B.

b) i) Translate Y 2 squares to the left and 6 squares up. Label the image C.

ii) Complete this statement:

The transformation which maps shape Y to shape Z is an enlargement with a scale factor _____ about the point _________.

(7 marks)
7. The organisers of a village festa write down the number of light bulbs used to decorate every street in the village. The following are the results:

55 122 153 86 42
0 84 132 0 75
92 185 140 187 121
57 73

a) Complete the frequency table on the right.

<table>
<thead>
<tr>
<th>Number of light bulbs</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 - 99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 - 149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 - 199</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b) Complete the bar chart below, representing the above information.

![Bar Chart]

Number of light bulbs

<table>
<thead>
<tr>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

0 - 49 50 - 99 100 - 149 150 - 199

Ansv: ___________

(8 marks)

c) One of the streets wins the competition for the best decoration. What is the probability that the number of light bulbs used for this street is between 100 and 149?

Ansv: ___________

(8 marks)
8. A prince needs to know the height $AB$ of his castle. From a point $C$ on the ground the angle of elevation of $A$ from $C$ is $32^\circ$. The distance $BC$ is $7.3$ m.

a) Using a ruler and a protractor, draw triangle $ABC$ accurately. Use a scale of $1$ cm : $1$ m.

b) Using your drawing, calculate the **actual** height of the castle $AB$.

Ans: ___________ metres

(4 marks)

9. Kaya and Mattias collect euro coins in different albums. Kaya’s album contains 12 coins per page. Mattias’ album contains 10 coins per page. All pages in both albums are full. The number of pages in Kaya’s album is $k$ while that in Mattias’ album is $m$.

a) Write an expression to represent the number of coins in

i) Kaya’s album

Ans: ___________

ii) Mattias’ album

Ans: ___________

b) If $k = 21$ and $m = 25$, who has the larger number of coins? Show your working.

(5 marks)
10. a) On a website, a video of Justin Beiber had 9,000,000 views. A few days later, this amount increased by 20%. By how many views has this amount increased?

Ans: _____________________ views

b) In September a shop had 600 T-shirts stored while in December this amount decreased to 372. What is the percentage decrease in the amount of T-shirts from September to December?

Ans: ________ %

(6 marks)

11. Nathaniel designs a symmetrical arrow on his computer. He first draws a square ABCD of side 5.1 cm. He then draws triangle EFG next to the square, as shown. The total length of the arrow is 9.7 cm and its height is 8.5 cm.

a) What is the area of the square ABCD?

Ans: __________ cm²

b) What is the length of EB?

Ans: _______ cm

c) What is the area of triangle EFG?

Ans: __________ cm².

(8 marks)
12. Use ruler and compasses only and on the diagram below,
   a) construct the bisector of angle BAX
   b) construct a perpendicular at point B.

13. In a LOGO program, Ryan types instructions to draw a series of lines:

1st line (L = 1)  FD10 RT90
2nd line (L = 2)  FD15 RT90
3rd line (L = 3)  FD20 RT90
4th line (L = 4)  FD25 RT90 etc.

a) What is the difference in length from one line to the next? Ans: ______ turtle steps
b) Fill in the space below to continue the instruction for the 10th line.
   FD ______ RT 90
c) Is the 90th line a horizontal or a vertical line? Explain.
   ____________________________________________________________
   ____________________________________________________________
d) Write down a rule which involves the line number (L) and the length of the line.
   ____________________________________________________________
   ____________________________________________________________

(5 marks)