INSTRUCTIONS TO CANDIDATES

- Answer all questions. There are 20 questions to answer.
- Each question carries 1 mark.
- Calculators, protractors and other mathematical instruments are not allowed.
- You are not required to show your working. However space for working is provided if you need it.
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Space for Working</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>A bag contains 2 kg of flour. A recipe uses 300 g of flour. Using only one bag of flour, how many times can the recipe be made?</td>
<td>__________ times</td>
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<tr>
<td>2</td>
<td>Write down the value of $n$, given that $2^n = 32$</td>
<td>$n =$ __________</td>
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<tr>
<td>3</td>
<td>What is the size of the obtuse angle between the hands of a clock at half past ten?</td>
<td>__________ °</td>
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<td>4</td>
<td>Write 45 minutes as a percentage of one hour.</td>
<td>__________ %</td>
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<tr>
<td>5</td>
<td>Work out: $\frac{2}{5}$</td>
<td>Answer: __________</td>
</tr>
<tr>
<td>6</td>
<td>Find $p$ and $q$ given that $200 = 2^p \times 5^q$</td>
<td>$p =$ ____, $q =$ ____</td>
</tr>
<tr>
<td>7</td>
<td>The circumference of a circle is equal to 24 cm. Underline the best estimate for the radius.</td>
<td>A. 4 cm B. 6 cm C. 8 cm D. 12 cm</td>
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<tr>
<td>8</td>
<td>A sum of money is divided in the ratio 2 : 3 : 5. The smallest share is €24. What is the sum of money?</td>
<td>€_____________</td>
</tr>
<tr>
<td>9</td>
<td>Work out the total area of the two rectangles.</td>
<td></td>
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<td></td>
<td><img src="image.png" alt="Diagram of two rectangles" /></td>
<td>Area = __________ cm²</td>
</tr>
<tr>
<td>10</td>
<td>A euro is approximately equal to £0.80. How much do I get for €200?</td>
<td>£_____________</td>
</tr>
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<td>11</td>
<td>A car travels at an average speed of 60 km/h for 3½ hours. How far does it travel?</td>
<td>__________ km</td>
</tr>
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<td>12</td>
<td>Given that ( f(x) = 2x - 5 ), work out the value of ( x ) if ( f(x) = 8 ).</td>
<td>( x = __________ )</td>
</tr>
<tr>
<td>13</td>
<td>Underline the point that passes through the line whose equation is ( y = 3x - 2 ). ( A(-2, -4) ) ( B(2, 4) ) ( C(2, -4) ) ( D(-2, 4) )</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Work out the value of ((0.4)^2 \times 1000). Give your answer in standard form.</td>
<td>Answer: __________</td>
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<tr>
<td>No.</td>
<td>Question</td>
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<tr>
<td>15</td>
<td>Divide 690 by 23.</td>
<td>Answer: ____________</td>
</tr>
</tbody>
</table>
| 16  | Underline the number which is equal to \( \frac{1}{4} \).  
   A. 4%  
   B. 0.4  
   C. 40%  
   D. 4\(^{-1}\) | |
| 17  | Underline the number of positive factors of 12.  
   A. 4  
   B. 5.  
   C. 6  
   D. 7 | |
| 18  | The perimeter of a rectangular field is 40 m. The length is three times the width. Work out the area of the field. | Area = __________ m\(^2\) |
| 19  | Work out the gradient of a line that passes through (6, –2) and (1, 8). | Gradient = __________ |
| 20  | Write 60% as a fraction in its lowest terms. | Answer: __________ |
1 Pawlu bought a car in January 2009 for €15 600. The price of the car decreased by 8% in 2009 and by 12% in 2010. Work out the price of the car on 31 December 2010. Give your answer correct to the nearest euro.

(3 marks)

2 Karmenu uses a spreadsheet to work out the simple interest.
(a) Write the formula which Karmenu types in
   (i) cell B4 = _____________
   (ii) cell B5 = _____________
(b) What output will Karmenu get in cell B5?

(4 marks)
3 The formula \( V = \frac{\pi r^2 h}{3} \) is used to find the volume of a cone.

(a) Work out the volume of a cone when \( r = 3.2 \text{ cm} \) and \( h = 5.7 \text{ cm} \). (Give your answer correct to 3 significant figures.)

Volume = _________ cm\(^3\)

(b) Make \( r \) the subject of the formula.

\[ r = \ldots \]  
(4 marks)

4 The equation of a straight line, \( L \), is \( 4x = 2y + 3 \).

(a) Write down the gradient and the \( y \)-intercept of this straight line.

gradient = _________
\( y \)-intercept = _________

(b) The line passes through the point \( A(2, b) \). Write down the value of \( b \).

\( b = \ldots \)

(c) Another straight line is parallel to \( L \) and passes through the point \( B(0, -5) \). Write down the equation of this straight line.

Equation of line: _______________  
(5 marks)
5  (a) Which one of these three triangles is not similar to the other two? Explain.

(b) The sides of a triangle have length 5 cm, 6 cm and 8 cm. The longest side of a similar triangle is 12 cm. Work out the length of the other two sides of this triangle.

_________ cm

_________ cm

(6 marks)
AB is a chord of a circle with centre O. OM is drawn perpendicular to AB.

(a) Prove that M is the midpoint of AB.

(b) C is a point on the circumference of the circle. OA = 6.2 cm and AB = 9.6 cm. Work out the size of \(\angle AOB\) and \(\angle ACB\) correct to 1 decimal place.

\[
\angle AOB = \underline{\text{_______}}^\circ \\
\angle ACB = \underline{\text{_______}}^\circ 
\]
7 \( x \) and \( y \) represent two numbers, \( x \) being larger than \( y \). Write down two equations to represent the following statements.
(a) The sum of \( y \) and double \( x \) is 4.
(b) The difference between the two numbers is 5.

\[
\begin{align*}
\text{(a)} & \quad y + 2x = 4 \\
\text{(b)} & \quad x - y = 5
\end{align*}
\]

(c) Hence solve the two equations.

\[
\begin{align*}
x & = \text{__________} \\
y & = \text{__________}
\end{align*}
\]

(6 marks)

8 (a) The diameter of an atom is 0.000 000 000 25 cm. Write this in standard form.

\[
\text{__________} \text{cm}
\]

(b) The speed of light is \( 3.0 \times 10^5 \) kilometres per second.

(i) Write this number in ordinary form.

\[
\text{__________} \text{km/s}
\]

(ii) The distance of the Earth from the Sun is 148 800 000 km. Work out the time taken for light from the Sun to reach the earth. Give your answer correct to the nearest minute.

\[
\text{__________} \text{minutes}
\]

(6 marks)
9  (a)  (i)  Form and simplify an equation in $x$.

______________________________

(ii) Solve this equation.

\[ x = \text{__________}^\circ \]

(b) One of the graphs below shows the cost of printing posters. The cost consists of a fixed charge and an additional charge for each poster printed.

Fill in with A, B, C or D.

Graph _____ best describes the cost of printing the posters.

\[ (x + 24)^\circ \]

\[ 2x^\circ \]
A boat, $S$, is 45 km South of a lighthouse, $L$. The boat sails to $X$, on a bearing of $055^\circ$ until it is due East of the lighthouse.

(a) Work out the distance $SX$. (Give your answer correct to 3 decimal places.)

$SX = \underline{\hspace{2cm}}$ km

(b) Work out the bearing of $S$ from $X$.

$\underline{\hspace{2cm}}^\circ$

(6 marks)
ECF is a tangent to a circle with centre O. A, B, C and D are points on the circumference of the circle.

(a) Explain why \( \angle ABC = 90^\circ \).

__________________________________________________________

(b) Work out the size of angles \( p \), \( q \) and \( r \). Give reasons for your answers.

\( p = \) \( _______ \) \( ^\circ \)
reason: ___________________________________________

\( q = \) \( _______ \) \( ^\circ \)
reason: _________________________________________

\( r = \) \( _______ \) \( ^\circ \)
reason: ___________________________________________

(7 marks)
(a) construct a triangle ABC in which AB = 8 cm, AC = 6 cm and BC = 9 cm.

(b) Construct the bisector of ∠ABC.

(c) Construct the line through A, perpendicular to BC. Mark the point X where this line meets the bisector of ∠ABC.

(d) Measure the length CX.

CX = _________ cm

(9 marks)
13 (a) A survey was carried out to find what 180 students did after they finished secondary school. These were the results.

- MCAST: 54
- Junior College: 36
- Higher Secondary: 45
- Employment: 29
- Unemployed: 16

(i) Draw a pie chart to show the information above.

(ii) What percentage of the students went to Higher Secondary? __________%

(b) The mean mass of 12 boys is 52 kg. The mean mass of 15 girls is 44 kg.

(i) Work out the total mass of the 12 boys.

Total mass = __________ kg

(ii) Work out the mean mass of the 27 children. (Give your answer correct to the nearest kilogram.)

Mean mass = __________ kg

(10 marks)