QUESTION 1

In this question, write only the correct letter (A–D) next to the corresponding number (1.1–1.10, for example 1.11 A).

1.1 Which ONE of the following numbers is rational?

A  \( \pi \)  
B  \( \sqrt{-1} \)  
C  \( \sqrt{3} \)  
D  \( \sqrt{10} \)  

1.2  \( \sqrt{27x^3} \) is

A  \( 3x^2 \)  
B  \( 9x^2 \)  
C  \( 9x \)  
D  \( 3x \)  

1.3 Christian installed an electric pump to pump water from a borehole into a 30 000 litre concrete dam. If the water is pumped at a rate of 75 litres per minute. How long does it take to fill the dam?

A  4 h  
B  6 h 40 min  
C  8 h 20 min  
D  3 h 40 min  

1.4 The next term in the sequence 1 ; 4 ; 9 ; ... is:

A  10  
B  12  
C  16  
D  14  

1.5 How many terms are there in the expression: \( \frac{x^2 - x + 2}{x - 1} \times \frac{2}{x - 2} \) ?

A  4  
B  1  
C  8  
D  2  

1.6 The volume of a cube below whose height is 4 cm is ...

A  8 cm\(^3\)  
B  16 cm\(^3\)  
C  32 cm\(^3\)  
D  64 cm\(^3\)  

1.7 In PQRS below, PR intersects with QS at T, such that PT = TR and QT = TS, then PQRS is a ...

A  rectangle  
B  parallelogram  
C  kite  
D  rhombus  

1.8 In \( \triangle ABC \), \( \beta = 50^\circ \) and \( \angle = 80^\circ \). What is the size of \( \angle \)?

A  130\(^\circ\)  
B  50\(^\circ\)  
C  100\(^\circ\)  
D  150\(^\circ\)  

1.9 The 3-D object with 5 faces, 5 vertices and 8 edges is a ...

A  cylinder  
B  triangular prism  
C  square based pyramid  
D  triangular based pyramid  

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Please turn over
1.10 The following set of test scores are out of 150 marks.

124 130 123 130 112 124 125 136 125.

The median is ...

A 123.
B 122.
C 125.
D 112. (1) [10]

QUESTION 2

2.1 Write the next term in the number pattern: 4; 7; 10; ...

2.2 Write down the general term, \( T_n \), of the pattern in QUESTION 2.1.

2.3 Calculate the 20\(^{th}\) term. (1) [4]

QUESTION 3

Simplify each of the following expressions:

3.1 \((5^7)^0\) (1)

3.2 \(\frac{x \cdot y - 4}{2} = \frac{x + 5}{3} = 0\) (2)

3.3 \(-(3x - 2)^2 + 4x\) (3) [6]

QUESTION 4

Factorise fully:

4.1 \(x^2 - 8x + 15\) (2)

4.2 \(\frac{1}{2}x^2 - 8\) (2)

4.3 \(x^2 + 3x + tx + 3t\) (3) [7]

QUESTION 5

Solve for \(x\):

5.1 \(3x + 4 = 10\) (2)

5.2 \(\frac{x}{3} = \frac{x + 5}{2} = 0\) (3)

5.3 \(x^3 = 125\) (2) [7]

QUESTION 6

6.1 Write 17 trillion in scientific notation. (1)

6.2 Mr T. can travel a certain distance in 3 h 30 min at an average speed of 90 km/h. At what average speed must he travel to complete the trip in 3 hours? (3)

6.3 Calculate the simple interest on R4 400 at 4% per annum for 7 years. (3)

6.4 Use the formula \(A = P(1 + \frac{r}{100})^n\) or \(A = P(1 + i)^n\) to calculate the compound interest at 7% per annum on a loan of R5 600 for 4 years. Round your answer to the nearest cents. (2)

6.5 A father is three times as old as his son. Six years ago he was five times as old as his son. How old are they now? (4) [13]

QUESTION 7

7.1 \(X(1, -4)\), \(Y(0, 5)\), \(Z(1, 6)\) are points on a straight line XYZ. Determine the equation of the line. (3)

7.2 Using THE ANNEXURE attached, draw the graph of the function defined by \(y = 2x - 1\) and \(y = -1\).
Label each graph and clearly mark the points where the graphs cut the axes. (5) [8]
QUESTION 8

NB: GIVE REASONS FOR ALL YOUR STATEMENTS IN THIS QUESTION.

8.1 In the diagram below, TR/PQ, S = 26°, TRS = x + 70° and P = x + 10°

8.1.1 Calculate the value of x, giving reasons.

8.1.2 Calculate the value of S/TR, giving reasons.

8.1.3 Is ΔPQS a right angled triangle? Justify your answer by means of calculations.

8.2 In ΔABC and ΔPTS B = 70° and P = 70°

8.2.1 Prove with reasons that ΔABC // ΔTSP

8.2.2 Determine y and x.

8.3 Study the figure below and answer the questions that follow.

8.3.1 Prove with reasons that ΔABC ≅ ΔDCB

8.3.2 If AB = 4 units, what is the length of BC?

QUESTION 9

9.1 P(-4; 1), Q(1; -3), and R(4; -1) are the vertices of ΔPQR. Write the coordinates of P', Q' and R' after reflection in the X-axis.

9.2 What kind of transformation is defined by the shapes below?
QUESTION 10

10.1 Determine the volume of a cylinder if \( r = 7 \text{ cm} \) and \( h = 20 \text{ cm} \).
NB: Use \( \pi = 3.14 \). Correct your answer to one decimal place.

10.2 In the figure below \( BC = 8 \text{ cm}, \ CD = 6 \text{ cm} \) and \( AB = 26 \text{ cm} \). Find the length of \( AD \).

10.3 The volume of a rectangular prism with length = 5 cm, breadth = 3 cm and height = 2 cm is 30 cm\(^3\). What will be its volume if all the dimensions are doubled?

QUESTION 11

11.1 The table below shows the number of pupils who participate in different extra-mural activities. Draw a pie chart to illustrate the data.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Tennis</th>
<th>Rugby</th>
<th>Cricket</th>
<th>Swimming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of learners</td>
<td>12</td>
<td>18</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

11.2 Calculate the range of the following set of test scores:

143 128 132 128 116 145 128 136 141

11.3 A coin is tossed twice:

11.3.1 Find the sample space by drawing a two way table

11.3.2 Determine the number of outcomes: \( n(S) \)

11.3.3 Determine the probability of getting at least 1 tail

TOTAL: 100