This question paper consists of 10 pages.
INSTRUCTIONS AND INFORMATION

1. Read the instructions for each question carefully.
2. Answer all the questions.
3. Write neatly and legibly.
4. Number your answers exactly as questions are numbered.
5. You may use an approved scientific calculator (non-programmable and non-graphical).
6. Clearly show **ALL** the calculations, diagrams, graphs, etcetera you have used in determining the answers.
7. Diagrams are **NOT** drawn to scale.
QUESTION 1

In this question, 4 possible answers are given. Write only the correct letter for the correct answer next to the corresponding number. Example: If the correct answer for 1.1 is A, write your answer as 1.1 A

1.1 \( \frac{1}{3} \) is...

A. only a rational number  
B. only a real number  
C. neither a rational nor real number  
D. both a rational and real number

1.2 The value of \( \sqrt{\frac{9}{16} x^2 y^4} \) is

A. \( 1\frac{3}{4} xy^2 \)  
B. \( 1\frac{1}{4} xy^2 \)  
C. \( 1\frac{5}{8} xy^2 \)  
D. \( 1\frac{3}{8} xy^2 \)

1.3 \( 2.8 \times 10 - 2.0 \times 10^{-2} = \)

A. 0.8  
B. 4.8  
C. 2.6  
D. 0.26

1.4 The sum of 3 times a number and 4 is equal to 67. Which one of the following equations matches the statement?

A. \( 4 - 3x = 67 \)  
B. \( 4(x + 3) = 67 \)  
C. \( 3x + 4 = 67 \)  
D. \( 3(x + 4) = 67 \)
1.5 When \( \frac{12x^2y - 6xy^2}{3xy} \) is simplified, the answer is:

A. \( 4x - 2y \)
B. \( \frac{2x - y}{3} \)
C. \( 2x^2y^2 \)
D. \( \frac{2x}{-y} \)

1.6 If the flow diagram uses 2; 4 and 6 to give the results as 7; 9 and 11. Which one of the rules below is used by the flow diagram to give the results?

A. \( 2n + 5 \)
B. \( n + 5 \)
C. \( \frac{n + 5}{2} \)
D. \( 2(n + 5) \)

1.7 The value of \( z \) in the figure below is………. 

A. 18°
B. 54°
C. 33°
D. 51°
1.8 In the figure below, \(AB = BC, AD = CD\) and \(BD\) bisects \(AC\) at \(O\).

![Diagram of quadrilateral ABCD with BD bisecting AC at O.]

Figure ABCD is a …

A Rectangle
B Trapezium
C Kite
D Parallelogram

1.9 In \(\triangle TUV\), the size of \(\angle U\) is…….

![Diagram of triangle TUV with angles labeled.]

A 65°
B 30°
C 45°
D 60°

1.10 If both dimensions of a rectangle are doubled, what will be its perimeter?

A \(1 \times\) the original perimeter
B \(2 \times\) the original perimeter
C \(3 \times\) the original perimeter
D \(4 \times\) the original perimeter
QUESTION 2

2.1 Calculate without using a calculator

2.1.1 \( 5,8 \times 10^{-4} + 2,3 \times 10^{-5} \) (write your answer in scientific notation) \( (2) \)

2.1.2 \( \frac{6 \sqrt[3]{0.04 a^2 b^6}}{3 \sqrt[3]{0.027 a^3 b^9}} \) \( (2) \)

2.1.3 \( 2 \frac{1}{4} y + 3 \frac{1}{2} y \times 1 \frac{2}{3} y - 5 \frac{1}{12} y \) \( (3) \)

2.2 Kulungile has 10kg of butternut. She sells a \( \frac{1}{4} \) of butternut to her aunt and \( \frac{1}{5} \) of the remaining butternut to her cousin.

2.2.1 How many kilograms of butternut is left? \( (3) \)

2.2.2 What percentage of butternut is sold altogether? \( (1) \)

2.3 A new TV costs R6 900 cash. It is available on hire purchase with a deposit of 15% followed by 12 monthly instalments of R558.50. Find the total hire purchase price and the extra amount that you would pay (on top of the cash price) using hire purchase. \( (3) \)

2.4 In winter temperatures usually change on certain days. On a particular Sunday in Pretoria at 6 a.m. the temperature was \(-4 \degree C\). During the morning it rose by \(15 \degree C\) at midday. Later it became cloudy and the temperature dropped again by \(7 \degree C\). Later, in the afternoon it rose by \(4 \degree C\) and finally fell by \(13 \degree C\) during midnight. What was the temperature in the next morning? \( (1) \)

2.5 Simplify.

2.5.1 \(-2(2x - 3)^2 - 6 + 3x(2x + 1) \) \( (3) \)

2.5.2 \( \frac{\sqrt{25a^4b^2} - 21a^4b^2 + \frac{3}{4}a(2a^5b^3)}{5a} \) \( (3) \)

2.5.3 \( 8^7 \times -8^{-5} + 119^0 \) \( (2) \)

2.5.4 \( \frac{8^n \times 2^{n+1}}{4^n} \) \( (2) \)

2.6 If \( x = -2 \), determine the numerical value of \( x^2 - 4x + 5 \) \( (2) \)

2.7 Solve for \( x \)

2.7.1 \( 3x = x + 12 \) \( (2) \)

2.7.2 \( \frac{x}{2} = -5 \) \( (1) \)

2.7.3 \( \left(x + \frac{1}{3}\right)(x - 2) = 0 \) \( (3) \)
2.7.4 \[-3x - 4 + 7x = 20 - 2x\] \hspace{1cm} (2)

2.7.5 \[3(x - 1) + 5 = -(x - 3)\] \hspace{1cm} (3)

2.7.6. \[\frac{2x}{3} - \frac{x+1}{4} = 1\] \hspace{1cm} (3)

2.7.7. \[\frac{(x+3)}{4} - \frac{(x-2)}{3} = x - 2\] \hspace{1cm} (5)

2.8 Phindile is 6 years younger than her sister. The sum of their ages is equal to their mother’s age. If the mother is 36 years old, how old is Phindile? \hspace{1cm} (3)

QUESTION 3

3.1 Study linear pattern below and answer the questions that follow.

Stage 1  Stage 2  Stage 3  Stage 4

3.1.1 Draw the diagram for stage 4. \hspace{1cm} (1)

3.1.2 Write the general rule for the number of rectangles in the form of \[T_n = \] \hspace{1cm} (1)

3.1.3 Use the rule obtained in 3.1.2 to determine the number of rectangles that will be needed to draw the diagram for stage 15. \hspace{1cm} (1)

3.1.4 Which stage of the pattern will have 81 rectangles? \hspace{1cm} (2)

QUESTION 4

4.1 Mr Martin invests R12 750 for 3 years at 5.3\% compound interest per annum. How much is his investment worth after 3 years? \hspace{1cm} (3)

4.2 Calculate the average speed of a car that travelled 720 kilometres in 6 hours. \hspace{1cm} (2)

4.3 Study the table below:

<table>
<thead>
<tr>
<th>The length of a side of a square in m</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of the square in (m^2)</td>
<td>9</td>
<td>16</td>
<td>25</td>
</tr>
</tbody>
</table>

Is this an example of a direct or indirect proportion? Give a reason for your answer.
QUESTION 5

5.1

5.1.1 Determine the value of $x$. (Provide reasons). (3)

5.1.2 Determine the size of $\angle y$. Provide reasons. (2)

5.2

In the diagram below, $AB \parallel CD$, $\angle ASE = 70^\circ$ and $\angle SFD = 120^\circ$.

5.2.1 Calculate the size of $\hat{3}$. Give reasons for your answer. (3)

5.2.2 Determine the value of $EFT$. (2)
QUESTION 6

6.1 The diagram below is rhombus ABCD with diagonal BD, AB is extended to E and \( \hat{A} = 70^\circ \).

6.1.1 Calculate the size of \( \hat{A}DC \). Give reasons for your answer. (3)

6.1.2 Determine the size of \( \hat{D}BE \) with reasons. (2)

6.2 Below is \( \triangle PQR \) with PQ // ST, ST = SR, \( Q\hat{P}R = 55^\circ \) and \( P\hat{Q}S = 27^\circ \).

Calculate with reasons the size of:

6.2.1 \( Q\hat{S}T \) (2)

6.2.2 \( T\hat{S}R \) (2)

6.2.3 Calculate the value of \( x \) with reasons. (3)
In the figure above, PR and QS intersect at O, PQ = RS, QR // PS and \( \measuredangle PQR = \measuredangle RSQ = 90^\circ \).

6.3.1 Prove that \( \triangle PQS \equiv \triangle SRP \). (4)

6.3.2 Prove that \( \triangle QOR \parallel \parallel \triangle POS \). (4)

[20]

TOTAL: 100