education
Department: Education
GAUTENG PROVINCE

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GRADE 10

MATHEMATICS

TERM 1
2023

MARKS: 50

TIME: 1 hours

This question paper consists of 6 pages including the information sheet.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of FIVE(5) questions.

2. Answer ALL the questions.

3. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining your answers.

4. Answers only will not necessarily be awarded full marks.

5. An approved scientific calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

6. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.

7. Diagrams are NOT necessarily drawn to scale.

8. Number the answers correctly according to the numbering system used in this question paper.

9. It is in your own interest to write legibly and to present your work neatly.

QUESTION 1

1.1 Given that:

$P = \sqrt{\frac{9}{11-x}}$, where $x \in \{-11;\ -5; 0; 15\}$

For which value(s) of x, is P

1.1.1 a rational number? (1)

1.1.2 an irrational number? (2)

1.1.3 non-real? (1)

[4]

QUESTION 2

2.1 Simplify the following expressions:

2.1.1 $(x-2y)(2x^2+xy-y^2)$ (2)

2.1.2 $\frac{x^2-x+1}{x^3+1} \div \frac{2}{x^2-1}$ (4)

[6]

QUESTION 3

3.1 Simplify the following:

3.1.1 $5x^0 + (5x)^0$ (1)

3.1.2 $\frac{8 \times 3^{-n}}{3^{-n+2} - 3^{-n}}$ (3)

3.2 Solve for x:

$2^{x+2} = 8$ (3)

[7]

QUESTION 4

4.1 Solve for x:

4.1.1 $15 - 3x = 2x - 25$ (1)

4.1.2 $-3 \leq 2x - 7 \leq 7$ (2)

4.1.3 $(x + 5)(2x - 8) = 0$ (2)

4.2 Given that:
$3x = 12$
$2x + y = 2$
Determine the value of $(x - y)^2$. (3)

4.3 Given: $E = \frac{1}{2}mv^2 + mgh$ make *v* the subject of the formula. (2)

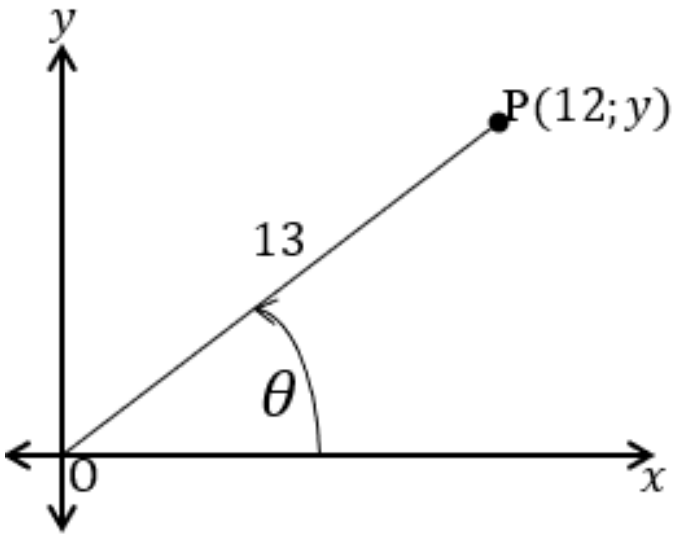
4.4 Kgethang saves R1 and R2 coins in his moneybox to buy R60 data bundles. He counted 34 coins after opening his moneybox.

How many R1 coins were in his moneybox? (4)
[14]

QUESTION 5

In the diagram below, the angle that P(12;y) makes with the positive axis is θ, and OP is 13 units.

5.1



Without the use of a calculator, determine

5.1.1 the value of y (2)

5.1.2 sin θ (2)

5.1.3 $\dfrac{\cot\theta}{cosec\,\theta} + 3$ (3)

5.2 Simplify WITHOUT the use of a calculator : $\sin^2 60° \times sec\ 45°$ (4)

5.3 Given : $3\cos x = 2$ and $0° \leq x \leq 90°$

Determine the size of x, correct to ONE decimal place. (3)

Hence determine:

5.3.1 $\cos(2x)$ (2)

5.3.2 $2\cos^2 x - 1$ (2)

5.4 What conclusion can you make from QUESTION 5.3.1 and 5.3.2 (1)

[19]

TOTAL 50