

END OF TERM HOLIDAY PACKAGE FOR 1st TERM, ACADEMIC YEAR 2023-2024

MATHEMATICS

Level three ALL

SECTION A: **Answer all questions**

Q1. Solve for x and y: $6 - 2\sqrt{5} = (\sqrt{x} - \sqrt{y})^2$

Q2. Solve the following inequalities:

a) $2x + 6 \geq x - 5$

b) $\frac{6+4x}{12} \geq \frac{3+4x}{12}$

c) $3(2x + 4) > 4x + 10$

Q3. a) Find x if $3x - 4 = -10$

b) Solve $(2x + 4)(x - 1) = 0$

Q4. Solve and discuss for x the equation $(2 - 3m)x + 1 = m^2(1 - x)$

Q5. A father is 30 years older than his son. 5 years ago he was four times as old as his son.

What is the son's age?

Q6. Solve in set of real numbers:

1. $(x + 1)(x - 1) < 0$

2. $\frac{2x - 3}{x} < 0$

3. $(4x - 3)(x - 1) \leq 0$

Q7. $\begin{cases} y = x + 3 \\ y = 2x - 1 \end{cases}$

solve by using substitution method

Q8. A machine has been marked up by 15% and is being sold for 78,500 FRW. How much did the store pay the manufacturer of the machine?

Q9. The length of a rectangle is twice its breadth. If the perimeter is 72m, find the length and breadth of the rectangle.

Q10. Solve for t: $-5t^2 + 14t + 3 = 0$

SECTION B: **Attempt all questions.**

Q11. Use Cramer's rule to solve

1.
$$\begin{cases} x + y = 2 \\ 4x - 4y = 8 \end{cases}$$

4.
$$\begin{cases} 5y + 3x = 2 \\ 10x + 6y = 0 \end{cases}$$

Q12.

Use elimination method to solve;

1.
$$\begin{cases} x - y = 3 \\ 2x - 2y = 6 \end{cases}$$

2.
$$\begin{cases} -x + 4y = 0 \\ 2x - 7y = 0 \end{cases}$$

4.
$$\begin{cases} 5y + 3x = 9 \\ 10x + 6y = 10 \end{cases}$$

5.
$$\begin{cases} 3x - 4y = 1 \\ x - 3y = 2 \end{cases}$$

Q13. Use comparison method to solve;

a.

$$\begin{cases} -y + 4x = 8 \\ x + 2y = 3 \end{cases}$$

b.
$$\begin{cases} 3x - 5y = 10 \\ 2x + y = 12 \end{cases}$$

Q14. Find the set of values of m for which $x^2 + 3mx + m = 0$ has:

- a) Two distinct real roots
- b) No real root
- c) One double root

Q15. Find the set of values of m for which $(m - 3)x^2 - 8x + 4 = 0$ has:

- a) Two distinct real roots
- b) No real root
- c) One double root

I wish you a merry Christmas and Happy New year.