

WAHSAK MATHEMATICS DEPARTMENT

S.3 MTC ASSIGNMENT 3 2020

TOPIC 1: QUADRATIC CURVES

1. (a) Draw the graph of $y = (2x + 3)(4 - x)$ for $-3 \leq x \leq 5$.
(b) State the equation of the line of symmetry of the curve.
(c) Use your graph to solve the following equations;
 - i. $5x + 12 - 2x^2$
 - ii. $(2x + 3)(4 - x) = -5$(d) Find the minimum value of y .

2. Copy and complete the table below for the domain $-4 \leq x \leq 4$.

x	-4	-3	-2	-1	0	1	2	3	4
$6 - x^2$									
$x^2 + 2$									

- (a) From the table above, draw the graphs of $y = 6 - x^2$ and $y = x^2 + 2$ on the same graph paper. [use a scale of 1cm : 1unit]
(b) Use your graph to solve the equation $6 - x^2 = x^2 + 2$.

3. (a) Copy and complete the table for $y = -2x^2 + x + 1$ for $-3 \leq x \leq 3$.

x	-3	-2	-1	0	1	2	3
$-2x^2$							
x							
1	1	1	1	1	1	1	1
y	-20						-14

- (b) Using the values in your completed table, draw the graph of $y = -2x^2 + x + 1$

(c) Use your graph to solve the equation $6 - x - 2x^2 = 0$.

TOPIC 2: RELATIONS, FUNCTIONS AND MAPPINGS.

4. (a) Given that $f(x) = \frac{2x+3}{2x^2-8}$, find the values of x for which $f(x)$ is undefined.

(b) If $g(x) = ax - b$, $g(3) = 4$ and $g(2) = 2$, find the;

i) Value of a and b

ii) $g^{-1}(x)$

5. Given that $x \longrightarrow x^2 - 1$ for the domain of $x = \{-3, -2, -1, 0, 1, 2\}$.

(a) Write down the set of values for the range.

(b) Represent the range and domain on an arrow diagram.

(c) Given that set $M = \{1, 2, 3, 4, 5, 6, 7, 8\}$, show the relation "is a factor of" by using a papygram.

6. (a) If $f(x) = x + 13$ and $g(x) = \log_{10}(x + 2)$, find;

i) $gf(x)$

ii) $gf(85)$

(c) If $f(y) = 2y + 3$, $g(y) = y^2 - 1$, find the values of y when $gf(y) = 8$.

TOPIC 3: MATRICES

7. Joan goes shopping and buys 3 books, 5 pens and 6 pencils. Her brother Joel buys 3 books, 8 pens and 4 pencils. In Kampala books cost shs. 800, pens cost shs. 400 and pencils cost shs. 200 each.

(a) Write down the;

i) 2×3 item matrix.

ii) 3×1 cost matrix.

(b) Use matrix multiplication to find how much Joan and Joel would spend in Kampala.

8. (a) Given that $A = \begin{pmatrix} 3 & 1 \\ 0 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 2 \\ -1 & 5 \end{pmatrix}$ and $C = AB$, find;

- i) Matrix C
- ii) Determinant of matrix C
- iii) Adjoint of C
- iv) Inverse of matrix C

9. Find k such that $A^2 + kA = 5T$ where $A = \begin{pmatrix} 3 & -4 \\ -2 & 1 \end{pmatrix}$ and $T = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$.