

Answer four questions only.

All questions carry equal marks.

All working must be clearly shown. Marks will not be awarded for correct answers without corresponding working.

1. (a) Given that $P = \{\text{factors of } 36\}$ and $Q = \{\text{factors of } 54\}$,
- list the members in the sets P and Q .
 - Find:
 - $P \cap Q$;
 - $n(P \cap Q)$;
 - the Highest Common Factor (HCF) of 36 and 54.

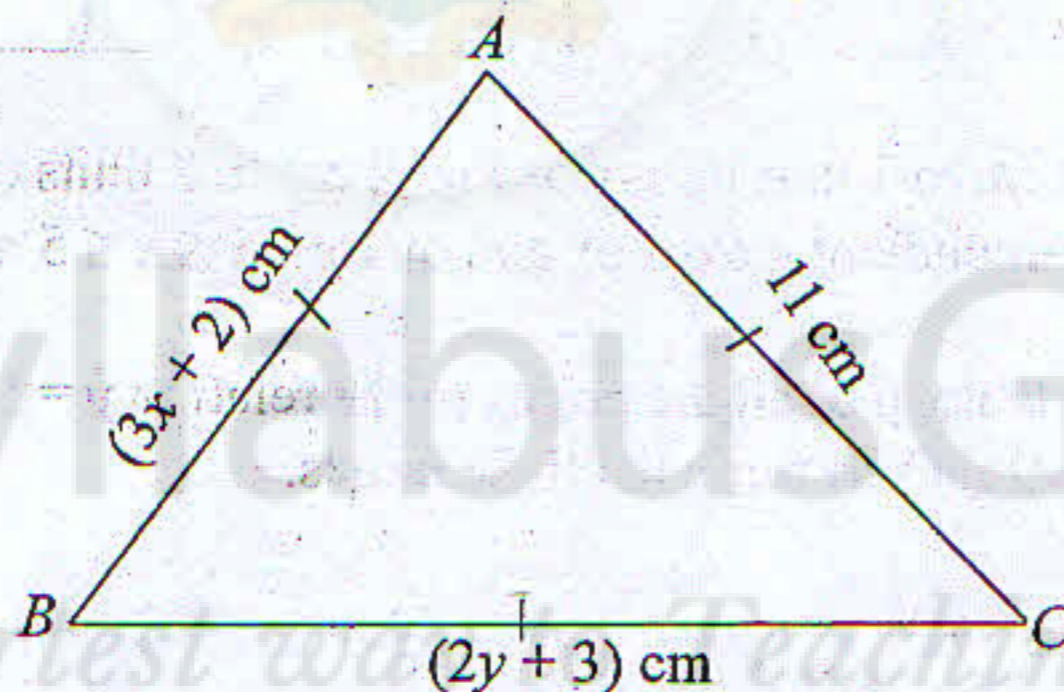
(b) Write down the next two terms of the sequence 1, 4, 9, ..., ...

(c) The median of the ordered set of observations 2, 3, $(4m - 3)$, $(3m + 1)$, 11 and 13 in ascending order is 6. Find the value of m .

2. (a) Simplify: $\left(\frac{1}{3} + \frac{1}{12}\right) \div \left(\frac{2}{3} - \frac{5}{8}\right)$.

(b) Find the product of $(2x - 3)$ and $(2x + 3)$.

(c)



NOT DRAWN TO SCALE

In the diagram, ABC is an equilateral triangle. Find the value of $(x + y)$.

3. (a) Given the relation $L = \frac{2(m^2 - n^2)}{4(m + n)}$:

- simplify L ;
- find the value of L when $m = 2$ and $n = 3$.

(b) Solve $\frac{4}{3x} = 7 - \frac{3}{x}$.

(c) A salesman gets a commission of $5\frac{1}{2}\%$ of the value of items he sells. The salesman

sells 12 textbooks at GH¢ 25.00 per book, 3 scientific calculators at GH¢ 50.00 per calculator and 8 packets of bic pens at GH¢ 50.00 per packet. Calculate the salesman's commission.

4. (a) Fred is $(x - 1)$ years old now. How old:
 (i) was he 4 years ago?
 (ii) will he be 8 years from now?
 (iii) is he now, if his age in 8 years time will be three times his age 4 years ago?

- (b) The perimeter of a rectangular cocoa farm is 497 km. The length of the farm is $2\frac{1}{2}$ times the width. Find the:
 (i) width;
 (ii) length of the farm.

5. (a) Factorize: $(x - y)(3m + n) - (x - y)(m - 2n)$.

- (b) Given that $\mathbf{p} = \begin{pmatrix} 2 - 3x \\ 5 - 2y \end{pmatrix}$, $\mathbf{q} = \begin{pmatrix} -1 \\ 5 \end{pmatrix}$ and $\mathbf{p} - \mathbf{q} = \begin{pmatrix} 6 \\ 8 \end{pmatrix}$, find the value of $(x + y)$.

- (c) (i) Find the truth set of $\frac{x-1}{2} \leq \frac{1}{2} + x$.
 (ii) Illustrate the answer in (i) on the number line.

6. (a) Copy and complete the table for the relation $y = 5 - 2x$ for $-3 \leq x \leq 4$.

x	-3	-2	-1	0	1	2	3	4
y	11			5		1		-3

- (b) Using a scale of 2 cm to 1 unit on x -axis and 2 cm to 2 units on the y -axis, draw on a graph sheet two perpendicular axes ox and oy for $-5 \leq x \leq 5$ and $-12 \leq y \leq 12$.

- (c) (i) Using the table, plot all the points of the relation $y = 5 - 2x$.
 (ii) Draw a straight line through all the points.

- (d) Using the graph, find the:

- (i) value of y when $x = -2.6$;
 (ii) value of x when $y = -2.8$;
 (iii) gradient of the line.

END OF ESSAY TEST