

CORE MATHEMATICS SYLLABUS

SENIOR HIGH SCHOOL

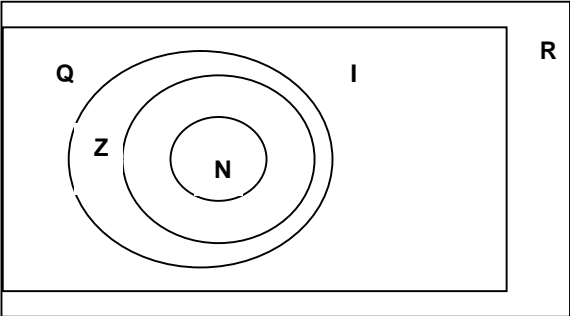
YEAR 1

*Core
Mathematics*

SENIOR HIGH SCHOOL 1

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1.1 SETS AND OPERATIONS ON SETS	The student will be able to: 1.1.1 determine and write the number of subsets in a set	Finding the number of subsets in a set with n elements	Review with students description of sets; - words/set builder notation - listing. - Venn diagrams. Guide students to deduce the number of subsets in a set with 'n' elements. i.e. the number of subsets = 2^n	Let students find the number of subsets in a given set.
	1.1.2 identify the properties of operations on sets.	Properties of Set Operations- Commutativity Associativity Distributivity	Guide students to determine the commutative property of sets involving given sets A and B i.e. $A \cap B = B \cap A$; $A \cup B = B \cup A$ Guide students to determine the associative property of sets involving three given sets A, B and C, i.e. $(A \cup B) \cup C = A \cup (B \cup C)$ and $(A \cap B) \cap C = A \cap (B \cap C)$ Guide students to determine the distributive property of sets involving three given sets A, B and C, i.e. $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ Illustrate the properties with Venn diagrams.	verify commutative, associative and distributive properties of operations on sets Illustrate properties of set operations using Venn diagrams

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
<p>1.1 (CONT'D)</p> <p>SETS AND OPERATIONS ON SETS</p>	<p>The student will be able to:</p> <p>1.1.3 describe the regions of a Venn diagram in terms of the set operations- union, complement</p> <p>1.1.4 find solution to practical problems involving classifications using Venn diagrams</p>	<p>Description and identification of the regions of Venn diagrams using set operations</p> <p>Three-set problems using Venn diagrams</p>	<p>Guide students to develop the concept of the complement of a set in a Venn diagram, E.g.</p> <div data-bbox="1294 459 1608 625" data-label="Diagram"> </div> <p>Guide students to</p> <ul style="list-style-type: none"> (i) describe regions of up to three (3) intersecting sets (ii) shade regions corresponding to given descriptions <p>Assist students to verify (using Venn diagrams) that given any two intersecting sets, A and B,</p> $(A \cup B)' = A' \cap B'$ $(A \cap B)' = A' \cup B'$ <p>Review two-set problems.</p> <p>Guide students to solve problems involving three sets</p>	<p>Let students</p> <p>draw 2 intersecting sets and shade given regions</p> <p>describe shaded regions of 3 intersecting sets</p> <p>solve 3 set problems involving real life situations</p>

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1.2 REAL NUMBER SYSTEM	<p>Students will be able to:</p> <p>1.2.1 distinguish between rational and irrational numbers.</p> <p>1.2.2 represent real numbers on the number line.</p>	<p>Rational and irrational numbers</p> <p>Real Numbers on the number line</p>	<p>Guide students to revise natural numbers, whole numbers and integers.</p> <p>Guide students distinguish between rational and irrational numbers i.e. rational numbers can be expressed as $\frac{a}{b}$, where a and b are real numbers and $b \neq 0$</p> <p>Guide students to draw Venn diagrams to illustrate the relationship between the members of the real number system.</p> <p>i.e.</p>  <p>Assist students to locate points for real numbers on the number line. E.g. $\frac{1}{2}, 0, \frac{1}{2}, 1, 1.5, \dots, 3.5$</p> <p>Guide students to</p> <p>(i) graph given sets of real numbers on the number line;</p> <p>(ii) find the range of values for a given graph. E.g. $-1 \leq x \leq 2$</p>	<p>Let students:</p> <p>Identify regions representing given types of real numbers from Venn diagrams.</p> <p>illustrate a given range of numbers on the number line</p>

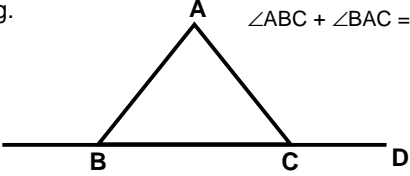
UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1.2 (CONT'D) REAL NUMBER SYSTEM	Students will be able to: 1.2.1 compare and order rational numbers 1.2.2 approximate by rounding off decimal numbers to a given number of place values 1.2.3 approximate a decimal number to a given number of significant figures 1.2.4 express recurring decimals as common fractions.	Comparing and ordering rational numbers Approximating and rounding off numbers Significant figures Recurring decimals	Assist students to compare and order different types of rational numbers E.g. common fractions, whole numbers, percentages, decimal fractions and integers using $<$, $>$ and the number line. E.g. arrange the fractions; 0.3 , $\frac{1}{4}$, 45% and 28 in ascending order. Guide students to approximate decimal numbers to given place values E.g. 587.3563 to 2 decimal places (nearest hundredth) is 587.36 and 5873456 rounded to the nearest thousand is 5873000 . Guide students to approximate given decimal numbers to given number of significant figures E.g. 46.23067 approximated to 5 significant figures is 46.231 . Review changing common fractions to decimals and vice versa. Guide students to realize that a recurring decimal has a digit or a block of digits which keep repeating E.g. $1.666\dots$ or $1.\dot{6}$ $0.727272\dots$ or $0.\dot{7}2$ Guide students to express recurring decimals as fractions of the form $\frac{a}{b}$ where $b \neq 0$ E.g. $0.\dot{7} = \frac{7}{9}$ and $0.\dot{1}8 = \frac{18}{99} = \frac{2}{11}$ verify results by using the calculator.	Let students: arrange sets of rational numbers in order of magnitude. round off numbers to given number of place values. approximate numbers to given number of significant figures. express given recurring decimal fractions as common fractions.

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UNIT 1.2 (CONT'D) REAL NUMBER SYSTEM	<p>Students will be able to:</p> <p>1.2.5 express very large or very small numbers in standard form.</p> <p>1.2.6 state and use properties of operations on real numbers.</p> <p>1.2.7 interpret given binary operations and apply them to real numbers</p>	<p>Standard form</p> <p>Properties of operations</p> <p>Commutative property</p> <p>Associative Property</p> <p>Distributive Property</p> <p>Binary operations</p>	<p>Guide students to express a very large number in the form; $k \times 10^n$, where $1 \leq k < 10$ and n is an integer. E.g. $14835 = 1.4835 \times 10^4$ $0.0034678 = 3.4678 \times 10^{-3}$</p> <p>Guide students to investigate the commutative properties of addition and multiplication. i.e. $a + b = b + a$ and $ab = ba$</p> <p>Guide students to investigate the associative property of addition and multiplication. i.e. $(a + b) + c = a + (b + c)$, and $(ab)c = a(bc)$</p> <p>Guide students to investigate the distributive property of multiplication over addition and subtraction. i.e. $a(b + c) = ab + ac$, and $a(b - c) = ab - ac$.</p> <p>Guide students to interpret and carry out binary operations on real numbers such as $a * b = 2a + b - ab$ $p * q = p + q - 2pq$. Use calculator to compute/perform binary operations</p>	<p>Let students:</p> <p>express given numbers in standard forms and vice versa</p> <p>State the properties of operations applied in given mathematical sentences.</p> <p>apply the appropriate properties to evaluate expressions E.g. $18 \times 22 = 18(20+2)$ $90 \times 95 = 90(100 - 5)$.</p> <p>carry out defined binary operations over real numbers E.g. if $m * n = m + n + 5$, find $8 * - 4$</p>

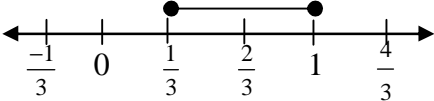
UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1.3 ALGEBRAIC EXPRESSIONS	<p>The students will be able to:</p> <p>1.3.1 express statements in mathematical symbols</p> <p>1.3.2 add and subtract algebraic expressions</p> <p>1.3.3 multiply two binomial Expressions</p> <p>1.3.4 factorize algebraic expressions</p> <p>1.3.5 apply difference of two squares to solve problems</p>	<p>Algebraic expressions</p> <p>Operations on algebraic expressions</p> <p>Binomial expressions</p> <p>Factorization</p> <p>Difference of two squares</p>	<p>Assist students to express simple statements involving algebraic expressions in mathematical symbols.</p> <p>Guide students to add, subtract and simplify algebraic expressions involving the four basic operations.</p> <p>Assist students to multiply two binomial expressions and simplify E.g. $(a + b)(c + d) = c(a + b) + d(a + b)$ $= ac + bc + ad + bd$</p> <p>Guide students to identify common factors in algebraic expressions and factorize (index of the variable not exceeding 2).</p> <p>Assist students to develop the rule of difference of two squares i.e. $a^2 - b^2 = (a + b)(a - b)$</p> <p>Guide students to apply the idea of difference of two squares to evaluate algebraic expressions E.g. $x^2 - y^2 = (x + y)(x - y)$ i.e. $5^2 - 4^2$ $= (5 + 4)(5 - 4) = 9 \times 1 = 9.$</p>	<p>Let students</p> <p>translate statements involving algebraic expressions in mathematical symbols.</p> <p>add and subtract algebraic expressions..</p> <p>expand and simplify product of two binomial expressions.</p> <p>factorize given algebraic expressions with variable index not exceeding 2.</p> <p>apply difference of two squares to simplify algebraic expressions</p>

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UNIT 1.3 (CONT'D) ALGEBRAIC EXPRESSIONS	<p>The students will be able to:</p> <p>1.3.6 perform operations on simple algebraic fractions.</p> <p>1.3.7 determine the conditions under which algebraic fraction is undefined or zero..</p>	<p>Operations on algebraic fractions with monomial denominators</p> <p>Operation on algebraic fractions with binomial denominators</p> <p>Undefined or Zero algebraic fractions</p>	<p>Guide students to add and subtract algebraic fractions with monomial denominators. E.g. $\frac{2}{a} + \frac{1}{x} = \frac{2x+a}{ax}$</p> <p>Assist students to add and subtract algebraic fractions with binomial denominators. E.g. $\frac{1}{x-b} + \frac{1}{x-a} = \frac{2x-a-b}{(x-b)(x-a)}$, where $x \neq a, x \neq b$</p> <p>Discuss with students the condition under which an algebraic expression is zero. E.g. in $\frac{3a}{5y}$, is zero. When $3a = 0$ i.e. $a = 0$</p> <p>Assist students to determine the condition under which an algebraic expression is undefined E.g. $\frac{1}{2-2x}$ is undefined when $2 - 2x = 0$. or when $x=1$</p>	<p>Let students</p> <p>solve problems involving addition and subtraction of algebraic fractions with monomial and binomial denominators.</p> <p>solve for the value of variables in algebraic fractions for which the fractions is zero.</p> <p>find the value of a variable for which an algebraic fraction is undefined.</p>

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UNIT 1.4 NUMBER BASES	<p>The student will be able to:</p> <p>1.4.1 convert base ten numerals to other bases and vice-versa</p> <p>1.4.2 solve simple equations involving number bases</p> <p>1.4.3 perform operations on number bases other than base ten</p>	<p>Converting base ten numerals to numerals in other base and vice versa.</p> <p>Operations on numbers involving number bases other than base ten.</p> <ul style="list-style-type: none"> • Addition and subtraction • Multiplication 	<p>Guide students to revise number bases by converting base ten numerals to bases two and five and vice-versa.</p> <p>Guide students to convert given numerals from base ten to numerals in other bases up to base twelve.</p> <p>Guide students to solve equations involving number bases E.g. $132_x = 42_{ten}$</p> <p>Guide students to add and subtract numbers in bases other than base ten.</p> <p>Guide students to construct addition tables for bases other than base ten.</p> <p>Guide students to find the product of two numbers and construct multiplication table in a given base other than base ten.</p>	<p>Let students:</p> <p>convert numerals in base ten to numerals in other bases and vice-versa.</p> <p>solve for the base of a number in equations involving number bases.</p> <p>construct addition table in given base other than base ten and use it to solve problems</p> <p>solve problems on number bases (other than base ten) involving addition and subtraction</p>

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UNIT 1.5 PLANE GEOMETRY I	<p>The student will be able to:</p> <p>1.5.1 calculate the angles at a point</p> <p>1.5.2 state and use the properties of parallel lines</p> <p>1.5.3 state and use the exterior angle theorem of a triangles</p>	<p>Angles at a point</p> <p>Parallel lines Relationships between corresponding angles, vertically opposite angles, alternate angles and adjacent angles, supplementary angles</p> <p>Exterior angle theorem</p>	<p>Revise with students the sum of angles on a straight line by measuring using a protractor.</p> <p>Assist students to use protractors to measure angles at a point to verify that they add up to 360°.</p> <p>In groups let students draw parallel lines and a transversal and, measure all the angles to discover the relationships between; corresponding angles, vertically opposite angles, alternate angles, adjacent angles, and supplementary angles.</p> <p>Perform practical activities with students to revise the sum of the interior and the sum of the exterior angles of a triangle. Guide students to apply this knowledge to find the value of missing angles in a triangle</p> <p>Guide students to perform practical activities to verify the exterior angle theorem of a triangle, students to measure the interior and the exterior angles of a triangle E.g.</p> <div style="text-align: center;">  <p>$\angle ABC + \angle BAC = \angle ACD$</p> </div>	<p>Let students:</p> <p>find missing angles in given diagrams</p> <p>find missing angles between parallel lines and a transversal</p> <p>find missing angles of triangles from given diagrams</p>

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UNIT 1.5 (CONT'D) PLANE GEOMETRY I	<p>The student will be able to:</p> <p>1.5.5 state the properties of quadrilaterals</p> <p>1.5.6 calculate the sums of interior angles and exterior angles of a polygon</p>	<p>Quadrilaterals</p> <p>Polygons</p>	<p>Guide students to use cut-out shapes and fold to establish congruent sides, congruent angles and, lines of symmetry of quadrilaterals such as parallelograms, kites, rectangles, etc.</p> <p>Guide students to establish the relation between the number of sides and the number of triangles in any polygon with 'n' sides</p> <p>Assist students to complete the table below.</p> <table border="1" data-bbox="1207 791 1697 1145"> <thead> <tr> <th>Polygon</th> <th>No. of sides</th> <th>No. of angles</th> <th>Sum of angles</th> </tr> </thead> <tbody> <tr> <td>Triangle</td> <td>3</td> <td>1</td> <td>180°</td> </tr> <tr> <td>Quadrilateral</td> <td>4</td> <td>2</td> <td>360°</td> </tr> <tr> <td>Pentagon</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hexagon</td> <td></td> <td></td> <td></td> </tr> <tr> <td>.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>n</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Guide them to use their results to find the formula for finding the sum of the interior angles of a polygon. i.e. $\text{sum of angles} = (n - 2)180^\circ$</p> <p>Guide students to perform activities to find the sum of the exterior angles of a polygon.</p>	Polygon	No. of sides	No. of angles	Sum of angles	Triangle	3	1	180°	Quadrilateral	4	2	360°	Pentagon				Hexagon				.				.				n				<p>Let students:</p> <p>find the number of lines of symmetry of given quadrilaterals. E.g. Rhombus Parallelogram, etc.</p> <p>calculate the sum of interior angles of given polygon</p> <p>find an interior or exterior angle of a polygon using the ideas of the sum of interior angles and exterior angles of a polygon.</p>
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UNIT 1.6 LINEAR EQUATIONS AND INEQUALITIES	Students will be able to: 1.6.1 find solution sets for linear equations in one variable. 1.6.2 solve word problems involving linear equations in one variable 1.6.3 solve linear inequalities in one variable and illustrate the result on the number line 1.6.4 solve word problems involving linear inequalities in one variable	Solution sets of linear equations in one variable Word problems involving linear equations in one variable Linear inequalities in one variable Word problems involving linear inequalities in one variable	Guide students to find solution sets of given linear equations in one variable E.g. $\frac{5x - 2}{4} = \frac{3x + 2}{2}$ $T = \{x : x = -6\}$ Guide students to solve word problems involving linear equations in one variable. Find and illustrate truth sets of linear inequalities in one variable on the number line. E.g. $0 \leq 3x - 1 \leq 2$ $\frac{1}{3} \leq x \leq 1$  Guide students to solve word problems involving linear inequalities in one variable	Let students find the truth sets of linear equations in one variable. solve word problems involving linear equations in one variable. solve problems involving linear inequalities in one variable and show the solution on the number line. solve real life problems involving linear inequalities

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UNIT 1.7 RELATIONS AND FUNCTIONS	<p>The students will be able to:</p> <p>1.7.1 distinguish between the various types of relations.</p> <p>1.7.2 Identify functions from other relations.</p> <p>1.7.3 determine the rule for a given mapping</p>	<p>Types of relations</p> <p>Functions</p> <p>Mapping</p>	<p>Review with students, relations between two sets; arrow diagrams; ordered pairs; domain; co-domain; range.</p> <p>Guide students to use arrow diagrams to illustrate types of relations including "one-to-one", "one-to-many", "many- to-one" and "many-to-many" relations.</p> <p>Use expressions of real life relations such as "is the father of", "is the wife of" to describe relations.</p> <p>(Encourage students to develop the sense of belongingness)</p> <p>Use arrow diagrams to guide students to identify the relations "one-to-one" and "many-to-one" as functions.</p> <p>Assist students to determine the rule for a given mapping on the set of real numbers</p> <div data-bbox="1294 954 1697 1257" data-label="Diagram"> </div> <p>The rule is: $f(x) = 2x - 3$.</p>	<p>Let students</p> <p>determine the type of relation described in a given arrow diagram.</p> <p>give reasons why a given relation is or is not a function</p> <p>determine the rule for a given function.</p>

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1.7 (CONT'D) RELATIONS AND FUNCTIONS	<p>The student will be able to:</p> <p>1.7.4 draw linear and quadratic graphs for given functions</p> <p>1.7.5 find the gradient of a straight line, given the co-ordinates of two points on the line</p> <p>1.7.6 find the equation of a straight line</p> <p>1.7.7 find the distance between two points</p> <p>1.7.8 change the subject of a relation</p>	<p>Graphs of Functions</p> <ul style="list-style-type: none"> - linear functions - quadratic functions <p>Gradient of a straight line</p> <p>Equation of a straight line</p> <p>Magnitude of a line segment</p> <p>Change of subject of a relation</p>	<p>Guide students to form table of values for a given linear function defined on the set of real numbers for a given domain.</p> <p>Guide students to use completed tables to plot points, draw graphs and read values from the graphs.</p> <p>Guide students to draw table of values for quadratic functions defined on the set of real numbers for a given domain.</p> <p>Assist students to use the table of values to draw quadratic graphs and also to read values from the graphs.</p> <p>Assist students to develop the ratio $\frac{y_2 - y_1}{x_2 - x_1}$ as the gradient of a straight line joining the points (x_1, y_1) and (x_2, y_2)</p> <p>Guide students to derive the equation of a line from $\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$ where (x, y) is an arbitrary point on the line</p> <p>Discuss with the students different forms of equation of a straight line i.e. (i) $y = mx + c$ (ii) $ax + by + c = 0$</p> <p>Guide students to find the distance between two points with given coordinates (x_1, y_1) and (x_2, y_2) as $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$</p> <p>Guide students to find one variable in terms of the others in a relation.</p>	<p>Let students draw graphs of given linear functions and read values of the function for a given pre-image and vice versa</p> <p>draw the graphs of given quadratic functions</p> <p>read the value of the function for a given pre-image and vice versa</p> <p>find the gradient of a line from given coordinates of points on the line</p> <p>find the equation of a line from given points on the line</p> <p>find the length of a line joining two given points</p> <p>change the subject of a relation.</p>

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UNIT 1.8 VECTORS IN A PLANE	<p>The student will be able to:</p> <p>1.8.1 distinguish between scalar and vector quantities</p> <p>1.8.2 represent vectors in various forms</p> <p>1.8.3 add and subtract vectors,</p> <p>1.8.4 multiply a vector by a scalar</p>	<p>Scalar and vector quantities</p> <p>Vector notation and representation</p> <p>Addition and subtraction of vectors</p> <p>Multiplying a vector by a scalar</p>	<p>Guide students to use diagrams to illustrate the idea of scalar and vector quantities.</p> <p>Guide students to identify the following:</p> <p>(a) free vector notation; a, u, etc.</p> <p>(b) position vector notation; \vec{OP}, \vec{OB}, etc.</p> <p>(c) representation of vectors in component form $\begin{pmatrix} x \\ y \end{pmatrix}$</p> <p>(d) in bearing-magnitude form (r, θ°)</p> <p>Guide students to add and subtract vectors. Eg.</p> <p>(a) $\begin{pmatrix} x_1 \\ y_1 \end{pmatrix} + \begin{pmatrix} x_2 \\ y_2 \end{pmatrix} = \begin{pmatrix} x_1 + x_2 \\ y_1 + y_2 \end{pmatrix}$</p> <p>(b) $\begin{pmatrix} x_1 \\ y_1 \end{pmatrix} - \begin{pmatrix} x_2 \\ y_2 \end{pmatrix} = \begin{pmatrix} x_1 - x_2 \\ y_1 - y_2 \end{pmatrix}$</p> <p>Guide students to multiply a vector by a scalar k.</p> <p>E.g. $k \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} kx \\ ky \end{pmatrix}$</p>	<p>Let students</p> <p>distinguish between scalar and vector quantities</p> <p>express given vectors with the appropriate notations</p> <p>find the sum and difference of given vectors</p> <p>multiply given vectors by given scalars</p>

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<p>1.8 (CONT'D)</p> <p>VECTORS IN A PLANE</p>	<p>The students will be able to:</p> <p>1.8.5 express the components of a vector in column form</p> <p>1.8.6 add two vectors using the triangle law of vector addition.</p> <p>1.8.7 state the conditions for two vectors to be equal or parallel</p>	<p>Column vectors</p> <p>Triangle law of vectors</p> <p>Equal and Parallel vectors</p>	<p>Guide students to use graph to determine components of vectors in column form for given coordinates E.g. A (x₁, y₁) and B (x₂, y₂) in the Oxy plane;</p> <p>(a) $\vec{OA} = \begin{pmatrix} x_1 \\ y_1 \end{pmatrix}, \vec{OB} = \begin{pmatrix} x_2 \\ y_2 \end{pmatrix}$</p> <p>(b) $\vec{AB} = \begin{pmatrix} x_2 - x_1 \\ y_2 - y_1 \end{pmatrix}$</p> <p>Using graphs guide students to deduce the triangle law of vectors addition. $\vec{AB} + \vec{BC} = \vec{AC}$ where A, B and C are points in the Oxy plane.</p> <p>Assist students to establish conditions for vectors to be equal or parallel :</p> <p>i.e. If. $\begin{pmatrix} x_1 \\ y_1 \end{pmatrix} = \begin{pmatrix} x_2 \\ y_2 \end{pmatrix}$, then $x_1 = x_2$ and $y_1 = y_2$.</p> <p>If $\begin{pmatrix} x_1 \\ y_1 \end{pmatrix}$ is parallel to $\begin{pmatrix} x_2 \\ y_2 \end{pmatrix}$ then $\begin{pmatrix} x_1 \\ y_1 \end{pmatrix} = k \begin{pmatrix} x_2 \\ y_2 \end{pmatrix}$, where k is a scalar.</p>	<p>Let students</p> <p>find the vector AB given coordinates of A and B</p> <p>find the coordinates of B, given the vector AB and the coordinates of A.</p> <p>find the diagonals of a quadrilateral ABCD in vector component form, given the coordinates of the vertices</p> <p>add two given vectors</p> <p>use the idea of equal and parallel vectors to solve related problems</p>

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1.10 RIGID MOTION I	<p>The student will be able to:</p> <p>1.10.1 identify and translate an object or point by a translating vector and describe the image</p> <p>1.10.2 identify and explain the reflection of an object in a mirror line</p> <p>1.10.3 describe the image points of shapes in a reflection</p>	<p>Translation by a vector.</p> <p>Reflection in a line.</p> <p>Characteristics of reflection.</p>	<p>Revise congruency through the use of lines of symmetries of plane figures.</p> <p>Guide students to identify some Ghanaian symbols that are symmetrical E.g. 'Gye Nyame' symbol.</p> <p>Guide students to slide shapes to demonstrate translation as movement in a straight line.</p> <p>Ask students to give real life examples of translation.</p> <p>Assist students to translate points and plane figures by given vectors on graph sheets and describe the images.</p> <p>E.g. Translate P(3, 4) by vector $\vec{PQ} = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$,</p> <p>Guide students to carry out different activities with concrete objects to identify the images of an object in a given mirror.</p> <p>Assist students to draw shapes on graph sheets and find their images under reflections in given mirror lines. i.e. $x = k$ $y = k$ $y = kx$, where k is an integer.</p>	<p>Let students</p> <p>translate plane figures and points by given vectors and state the image points</p> <p>draw images of geometric shapes under reflection in given mirror lines and state the points</p>

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UNIT 1.11 STATISTICS I	<p>The students will be able to:</p> <p>1.11.1 draw frequency distribution tables for ungrouped and grouped data</p> <p>1.11.2 represent data on a suitable graph</p> <p>1.11.3 calculate the mean using appropriate formula</p> <p>1.11.4 estimate the mode from a histogram</p>	<p>Frequency distribution tables.</p> <p>Graphical representation of data.</p> <p>Mean of a distribution.</p> <p>Estimating the mode from a histogram.</p>	<p>Guide students to prepare frequency tables for grouped and ungrouped distributions. (exclude unequal class intervals)</p> <p>Guide students to use appropriate graph to represent data from real life situations like test scores, rainfall, health records, imports, exports etc.</p> <p>(Use pie charts and bar charts for ungrouped data and histograms for grouped data).</p> <p>Assist students to calculate the mean using the formula:</p> <p>(i) $\bar{x} = \frac{\sum x}{n}$ for ungrouped data</p> <p>(ii) $\bar{x} = \frac{\sum fx}{\sum f}$ for grouped data.</p> <p>Guide students to use a histogram to estimate the mode.</p>	<p>Let students:</p> <p>construct frequency tables for grouped and ungrouped data and represent them on suitable diagrams.</p> <p>calculate the mean of a given data using the appropriate formula</p> <p>draw histogram for a given data and use it to estimate the mode</p>

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<p>UNIT 1.12 RATIO AND RATES</p>	<p>The students will be able to:</p> <p>1.12.1 divide a quantity in a given ratio.</p> <p>1.12.2 interpret scales used in drawing plans and maps and use them to calculate distances between two points</p> <p>1.12.3 convert foreign currencies into Ghana cedis and vice versa</p>	<p>Ratio</p> <p>Scales</p> <p>Foreign exchange</p>	<p>Guide students to revise the idea of ratio by finding how many times one quantity is of the other E.g. 7 and 21 are in the ratio 1 : 3</p> <p>Assist students to share given quantities in given ratios. E.g. Share GH ₵2.5m in the ratio 3 : 2.</p> <p>Guide students to examine maps, plans “toposheets” and identify the scales used. E.g. a scale of 1 : 125000 means 1cm on the map represents 125000 cm on the ground.</p> <p>Guide students to use given scales to draw plans of given areas in the locality or in the school and let them draw geometric shapes using scales.</p> <p>Guide students to use rates obtained from Forex Bureau or banks to convert given amounts in foreign currencies to Ghana cedis and vice versa. [the use of calculator and spread sheet (Computer) is recommended] E.g. If \$1 = GH ₵0.96 find in cedis\$25.60</p> <p>Assist students with samples of water bills, electricity bills, telephone bills and population charts to explain the idea of rates.</p>	<p>Let students</p> <p>solve word problems involving division of quantities in given ratios</p> <p>draw plans of given places and shapes</p> <p>find actual distances between two points on a map for a given scale</p> <p>convert given amounts of foreign currencies into Ghana cedis and vice versa</p>

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
1.12 (CONT'D) RATIO AND RATES	The students will be able to: 1.12.4 explain and use common rates such as kmh^{-1} , ms^{-1} 1.12.5 draw travel graphs and interpret them.. 1.12.6 calculate and compare population densities	Rates. Travel Graphs. Population Density.	Guide students to solve problems involving rates, E.g. speed of a vehicles, wages and salaries Guide students to draw a distance–time graph from a given data and use it to calculate average speed, total distance traveled, total time taken, etc. Assist students to calculate population density as population per square kilometer (collect data from statistical services department or the internet).	Students: solve practical problems involving rates draw distance – time graph for a given data and interpret. calculate and compare population densities in cities urban and rural areas

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<p>UNIT 1.13</p> <p>PERCENTAGES I</p>	<p>The students will be able to:</p> <p>1.13.1 compare two amounts or quantities by expressing one as a percentage of the other.</p> <p>1.13.2 do money-making calculations that apply percentages.</p> <p>1.13.3 Do money-spending calculations that apply hire purchase.</p>	<p>Comparison by percentages.</p> <p>Discount, Commission, Simple Interest.</p> <p>Hire Purchase.</p>	<p>Assist students to express one quantity as percentage of another.</p> <p>Guide students to calculate percentage increase or decrease on prices of goods and services.</p> <p>Guide students to calculate discount as money saved on goods bought and commission as money earned in a transaction.</p> <p>Assist students calculate the price of goods when discount and commission are given.</p> <p>Guide students to use current bank rates to calculate interests on savings and loans</p> <p>Guide students to explain and perform calculations involving Hire Purchase.</p> <p>NB: the use of calculator to check computation should be encouraged</p>	<p>Let students:</p> <p>calculate the value of one quantity as a percentage of another.</p> <p>solve problems involving discount and commission.</p> <p>work out hire purchase payments over given periods</p>