Ministry of Education, Science and Technology

Accelerated Teaching Syllabus for

Senior Secondary I, II, III and IV Mathematics

(2015 – 2016)

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Please see final page for further information.

End of year goals: At the end of SSS 1, learners should be able to simplify fractions, decimal, ratios, algebraic expressions, solve problems on linear equations, estimate percentages and use notations and Venn diagrams.

Senior Secondary I: Mathematics, **Term:** 1				
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
Number and Numeration Week 1-2	**Fractions**	Carry out basic operations on fractions.	Learners should be able to add, subtract, multiply and divide up to three fractions. Learners should be able to apply BODMAS in solving fractions.	Review fractions with respect to BODMAS $5\frac{1}{3} + 1\frac{3}{4} - 3\frac{1}{2}$ $3\frac{4}{9} \div (5\frac{1}{3} - 2\frac{3}{4}) + 5\frac{9}{10}$
	Decimal	Carry out basic operations on Decimals.	Learners will be able to add, subtract, multiply and divide decimals.	$\frac{2.3 \times 5.126 + 3.68.3}{8.432 - 6.82}$
	Approximation	Round to a given number of significant figures, decimal places and nearest whole numbers.	Learners should be able to approximate number to a required degree of accuracy.	Explain with examples the approximation types. 89.765

Senior Secondary I: Mathematics, Term: 1				
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				90(nearest whole number) (2 decimal places) 89.77 89.8 (3 significant figures)
Number and Numeration Week 3-4	**Number bases**	Interpret and use numeration in bases other than base ten. Carry out basic operations on number bases.	Learners should be able to convert to base ten, and from one base to any other base. Learners should be able to solve problems involving addition, subtraction and multiplication of number bases.	Relate base 10 to other bases. Express (i) 2310 to base 6 Find (i) $356_7 + 421_1 -305_7$ (ii) $276_9 +135_9$ Use powers of numbers to set up equation. Solve (i) $4^{x+3} =32$ (ii) $2(3-x) = 81^{5-2x}$ (iii) $124_x =310_4$
Number and Numeration Week 5	**Modular arithmetic**	Understand the concept of modular Arithmetic.	Learners should be able to interpret modular Arithmetic.	Use long division to illustrate modular arithmetic. 6+4= 3(Mod7)

Senior Secondary I: Mathematics, Term: 1				
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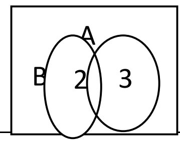
		Carry out addition, subtraction and multiplication in modular arithmetic.	Learners should be able to carry out addition, subtraction and multiplication up to base ten. Learners should be able to apply number bases to daily life activities.	2 x 5=4(Mod 6)
Number and Numeration Week 6-9	**Indices**	Discuss the basic rules in the multiplication and division of numbers with the same base, zero index and fractional index.	Learners should be able to apply the rules of indices.	Use numbers to illustrate the Laws of indices. (i)a^xx a^y = a^{x+y} (ii)a^x÷ a^y = a^{x-y} (iii) $(a^x)^y$ =a^{xy} (iv)a^0 = 1 (v) $a^{-x} = \frac{1}{a^x}$ (vi) $a^{\frac{1}{y}} = \sqrt[y]{a}$ (vii) $a^{\frac{x}{y}} = (\sqrt[y]{a})^x$ or $\sqrt[y]{a^x}$

Senior Secondary I: Mathematics, Term: 1				
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
	Exponential equation	Use the laws of indices in solving exponential equations.	Learners should be able to extract and solve simple equations from exponential equations.	Use powers of prime numbers to solve indicial equations. $27^{x-1} = 81$ $3^{3(x-1)} = 3^4$ 3 (x-1) = 4
	Standard form	Express numbers in the form a x 10^n where n is an integer and 1≤ a >10	Learners should be able to solve problems involving standard form.	Use powers of 10 to express in standard form 150000000 $=1.5 \times 10^8$ 0.000455 = 4.55×10^{-4}
	Logarithm	Use of tables of logarithms and anti-logarithms. Use of the tables with squares and square roots. Discuss the basic rules of logarithm of numbers.	Learners should be able to use log tables to do multiplication, division, powers and roots. Learners should be able to read squares, square roots and reciprocals from the table.	Use log tables to simplify. $\frac{78.72 \times \sqrt{3.912}}{(9.732)^2}$ Explain reciprocals using examples. Reciprocal of 4.5 $=\frac{1}{4.5}$

Senior Secondary I: Mathematics, Term: 1				
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
		Discuss the relationship between indices and logarithms.	Learners should be able to apply the basic rules of logarithm of numbers using base ten. Learners should be able to know that if $\log_{10}{}^{x} = n$, then $x = 10^{n}$	Use numbers to apply the laws of logs. e.g. $\log_{10}(Pq) = \log_{10}{}^{p+}\log_{10}{}^{q}$ $\log_{10}\frac{p}{q} + \log_{10}{}^{p-}\log_{10}{}^{q}$ $\log_{10}p^{q} = q \log_{10}{}^{p}$ Use the definition of logarithms to solve problems. $\log_{10}{}^{x} = 3 \Rightarrow x = 10^{3} = 1000$
Number and Numeration Week 10-12	**Sequence and series**	Use linear expressions to describe the n^{th} term of a sequence. Use the nth term to educate any term of the Arithmetic Progression.	Learners should be able to determine a given term of a sequence. Learners should be able to use the nth term of the Arithmetic Progression to determine any term.	Use substitution to evaluate terms of sequences. $U_n = 2n-1$ $U_1 = 2(1) – 1 = 2 - 1 = 1$ $U_2 = 2(2) – 1 = 4 - 1 = 3$ Use numbers to explain n^{th} term Un and their sum Sn.

Senior Secondary I: Mathematics, **Term:** 1

Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
		Find the sum of the first n^{th} terms of any Arithmetic Progression. Use the n term to evaluate any term of a Geometric Progression	Learners should be able to use the sum of n terms of the Arithmetic Progression to determine the sum of a range of terms. Learners should be able to use the nth term of the Geometric Progression to determine any term.	$U_n = a + (n-1)d$ $S_n = \frac{n}{2}(2a + (n-1)d)$ Use G.P. Series to explain $U_n = ar^{n-1}$ 3,9,27,51..... $U_n = 3(3)^{n-1}$
	Sets	Understand the definition of a set. Use of a set notations €, C, U, £, Q, P" (Compliment of P).	Learners should be able to give various examples of sets, and to determine union, intersection and compliment.	Explain how Venn diagrams are drawn and interpreted. 

Senior Secondary I: Mathematics, Term: 1				
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
		Explain the types of sets (universal sets, finite and infinite sets, subsets, empty sets and disjoint sets). Solution of practical problem involving classification using Venn diagrams (use of Venn diagrams restricted to at most three (3) sets).	Learners should be able to determine a subset, that two sets are disjoint. Learners should be able to draw and interpret Venn diagram (almost three).	€ = {1,2,3,4,5,6,7} AUB = {1,2,3,4,5,6} AnB= {1,3} A' = {4,6,7} N(A) =4

End of year goals: At the end of SSS 1, learners should be able to simplify fractions, decimal, ratios, algebraic expressions, solve problems on linear equations, estimate percentages and use notations and Venn diagrams.

Senior Secondary I: Mathematics, **Term:** 2				
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
Number and Numeration Week 1 - 3	**SURD**	Brief review of indices. Reduce non basic surds to basic surds. Add and subtract like surds. Work out the product of two surds and rationalize the denominator of fractional surds.	Learners should be able to eliminate square root by square. Learner should be able to sueperfect square to simplify surds to add and subtract and multiply surds. Learners should be able to rationalize the denominator of fractional surds.	Review perfect squares and their square roots $(\sqrt{x})$ = x $\sqrt{18} = \sqrt{9\ x\ 2}$ $= \sqrt{9 \quad x}\sqrt{2}$ $= 3\sqrt{2}$ $\sqrt[5]{2} + \sqrt{8} - \sqrt{18}$ $= \sqrt[5]{2} + \sqrt[2]{2} - \sqrt[3]{2} = \sqrt[4]{2}$ $\frac{2}{\sqrt{3}} = \underline{\sqrt[2]{3}}$

Senior Secondary I: Mathematics, Term: 2				
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
Number and Numeration Week 4	**Ratio and Proportion**	Use ratio notation. Reduce to simplest form. Divide a quantity in a given ratio or ratios. Solve world problems on ratio and proportion. Give examples and solve problems on rates.	Learners should express ratios in the form 1:nLearners should share a given quantity proportionately. Learners should interpret word problems and solve them. Learners should know common rates, density VAT.	Review simplification of ratios. 25:200 =1:8 Share Le416 in the ratio 5:3 or 4:3:1 Include legacies, maps. Speed = $\frac{\text{Distance}}{\text{Time}}$ Density = $\frac{\text{Mass}}{\text{Volume}}$ L1 = Le550,000
Number and Numeration Week 5	**Percentages**	Understand percentage as number of parts/100. Explain a given number as a percentage of another understands percentages as operators. Solve simple percentage problems relating to profit	- Learner should express one number as a percentage of another. - Learners should calculate a given percentage of a quantity. - Learners solve problems on these special percentages.	Differentiate between % and what % of 36 as a % of 144. $=\frac{36}{144}$ x100 =25%

Senior Secondary I: Mathematics, **Term:** 2

Theme/ Concept	Topic	Objectives	Learning outcome	Suggested Teaching/Learning Activities
		and loss, discount, Simple Interest, Compound Interest up to those years, hire purchases and percentage errors.		15% of 120 =$\frac{15}{100}$x 120 Explain the relevant terms in Percentage profit =$\frac{profit}{cost\ price}$ x 100 S I =$\frac{PTR}{100}$ etc.
Number and Numeration Week 6	**Variation**	Explain the types of variations. Use variation to evaluate unknown quantities.	Learners should express y x x as y =Kx (K is a constant). Yx$\frac{1}{x}$ as yx =c (c is a constant) Yx X and yx X^2 as y = kX + cx^2 Yx both x and y as y = hxy	Work out examples on the types on variations. (i)Varies as x and as x^2 (ii)varies partly as X and partly as x^2
Algebraic Processes	**Algebraic expression**	Interpret mathematical statement symbolically.	Learners should be able to understand the word problems.	Explain the term. (i)Twice as old as 2x

Senior Secondary I: Mathematics, Term: 2				
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Week 7		Supply numerical value; for algebraic expressions.	Learners should use a letter to represent an unknown number.	(ii)Four years younger etc. where x years (x-4) is age.
Week 8	**Simple operations on Algebraic expressions**	Expand the product of two simple linear expressions.	Learners should be able to multiply a single term over a bracket.	Demonstrate the expansion of brackets. (a+b)(c+d) A(c+d) b(c+d) = ac +ad +bc +bd
	Factorization	Present an algebraic expression as product of two linear expressions.	Learners should be able to identify common factors, difference of two squares and split the middle term in the case of trinomials.	Demonstrate the types of factorise (i)$3x^3-2x^2+x = x(3x^2 \text{ x } 2x +1)$ (ii) $4-x^2 =2^2 – x^2$ (iii)$2x^2 +9x +4 = 2x^2 + 8x + x +4$
Algebraic Processes Week 9	**Binary**	Understand the concept of binary operations. Evaluate binary operations in given number base.	Learners should be able to use substitution to evaluate binary operations	Use the binary operation $a^*b = 2a + b- ab$ to (a) Calculate (i) 3^*2 (ii) (ii) 5^*8

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				(b) Solve (i)$5^*m=2$ (ii) $a^*4=2$
Week 10	**Linear Equation**	Solve linear equations with integers or fractional coefficients in one unknown. Set up simple linear equation from data given.	Learners should be able to solve/find the truth set (solution set) for linear equations in one variable.	Demonstrate the solution of equation (i)$4x – 2 =10 –x$ (ii) $5x +17 = 3(x +6)$ (iii)$\frac{1}{6x} + \frac{1}{3x} = 5$ The three angles of a triangle are a^0, $(a +10)^0$, $(a+ 20)^{0,}$ Find the value of a
Algebraic Processes Week 11	**Simultaneous linear equations**	Calculate the exact solution of two simultaneous liner equations. Set up simple simultaneous linear equations from data given.	Learners should be able to find the truth set of simultaneous linear equations by elimination substitution and graphical methods. Learners should solve word problems using simultaneous equations.	Demonstrate the solution of simultaneous equations using elimination, substitution, and graphs. $3x – 4y =7$ $2x – y = 8$ $2x + 3y = 17$

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Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**
				3x – 5y =35 Use letters to set up equations. Sum of two numbers is 75, their difference is 39, find the numbers.
Algebraic Processes Week 12	**Change of subject of formula/relations**	Understand the process of changing the subject of formula/relation. Finding the value of an unknown in a given formula/relation.	Learners should be able to apply algebraic principles effect the change of subject. Learners should be able to substitute numbers for letters in a formula.	Illustrate change of subject using examples If $\frac{1}{f}=\frac{1}{u}+\frac{1}{u}$, find V. Given that U=6 and f=2, find the value of V.
Algebraic Processes Week 13	**Algebraic fraction**	Manipulate algebraic fractions with monomial denominators. Manipulate algebraic fractions with binomial denominators.	Learners should be able to apply simplification of fractions in solving both monomial and binomial denominators. Learner should be able to apply a solution of equation to determine the nature of a fraction.	$\frac{3}{x}-\frac{4}{2x}$ simplify Use lcm to simplify $\frac{3}{2-x}-\frac{2}{1+x}$ for what values of x is $\frac{x2-4x}{x2+X-12}$

Senior Secondary I: Mathematics, **Term:** 2

Theme/ Concept	Topic	Objectives	Learning outcome	Suggested Teaching/Learning Activities
		Find the value(s) for which a given fraction undefined not defined.		(Equate denomination to zero) (equate numerator to zero) (i) $Not\ defined$ (ii) $Equal\ to\ zero\ (0)$
	Linear inequalities	Understand and use the symbols,><≥ and ≤ vertion for open and close intervals. Solve simple linear inequalities on one variable.	Learners should be able to interpret the symbols. Learners should be able to interpret the solution of linear inequalities on the variable on the number line.	Read out (i)$1<x\le 5$ (ii) Read out  -1 0 1 2 3 4 $x>-1$ $x\le 4$ solve (ii) 3x -2 <10, so $x>4$

End of year goals: At the end of SSS 2, learners should be able to solve quadratic equations by factorisation, construct angles of 60^0 and 90^0, bisect angles and line segments, represent data using pie, charts, bar charts, histograms, and gives, and solve simple probability problems.

Senior Secondary II: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Algebraic Processes Week 1	**Quadratic equations**	Solve quadratic equations by factorisation; sue of the formula and completing the square. Form quadratic equations with given roots. Apply solution of quadratic equations to practical problems.	Learners should apply factorisation and substitution to solve quadratic equations. Learners should apply expansion of two linear expressions. Learners should be able to interpret and form quadratic equations.	Solve using factorization the formula. (i) x=6=$\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ (i) $3k^2 + 11k - 20 = 0$ (ii) $2x^2 - 3x + 1 = 0$ Form quadratic equation whose roots are – 3 and $\frac{5}{2}$ Set up a quadratic equation to solve:	

<table>
<tr><th colspan="5">Senior Secondary II: Mathematics, Term: 1</th><th></th></tr>
<tr><th>Theme/ Concept</th><th>Topic</th><th>Objectives</th><th>Learning outcome</th><th>Teaching/Learning Activities</th><th>Teaching and Learning Aids</th></tr>
<tr><td></td><td></td><td></td><td></td><td>(i)A boy is 5 years older than his sister, the product of their ages 150, find their ages.</td><td></td></tr>
<tr><td>Algebraic Processes

Week 2</td><td>Graphs of linear and quadratic functions</td><td>Compute table of values plot coordinate of points on coordinate system.

Use ruler and pencil to draw straight line graph.

Use free hand to draw a quadratic graph.</td><td>Learners use substitution to construct table of values.

Learners locate and mark points (x,y) on the coordinate axes with given scales.

Learners joins the points using a ruler (for straight lines) or free hand (for quadratic functions)</td><td>Copy and complete a table of values for

(i)y =2x +1 (-2≤ x≤4)

(ii) y =x^2 – 3x +2(-2≤ x≤4)

Plot and draw the points on a coordinate system.

(i)
<table>
<tr><td>X</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>y</td><td>-3</td><td>-1</td><td>1</td><td>3</td><td>5</td><td>7</td><td>9</td></tr>
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<tr><td>Week 3</td><td></td><td>Find the coordinates of maximum and minimum prints on one graph.

Identify the axis of symmetry.

Solve related equations from graphs and determine gradient at a given point.</td><td>Learners locate coordinates of point of intersection and the intercepts on the coordinated axes.

Learners should locate and read coordinates of maximum and minimum points. Learners should be able to indicate the line of symmetry and write its equation.

Learners should rearrange equations to identify the required y-values.

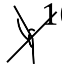
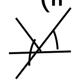
Learners draw a tangent and complete a right angled triangle.</td><td><table><tr><td>X</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>12</td><td>6</td><td>2</td><td>0</td><td>0</td><td>2</td><td>6</td></tr></table>
$Y = 2x + 1$, $y = x^2 \ 3x + 2$

$X^{2\,-} 3x - 3 = 0 \Rightarrow x^2 - 3x - 3 + 5 = 5$

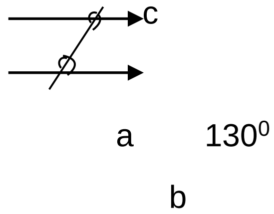
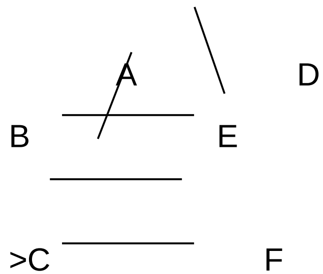
i.e. $x^2 - 3x + 2 = 5 \Rightarrow y = 5$

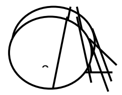
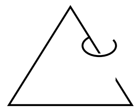
calculate tangent to

$y = x^2 - 3x + 2$ at $(3,2)$</td><td></td></tr>
</table>

Senior Secondary II: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Plane Geometry Week 4	**Angles**	Distinguish between acute, right, obtuse, reflex, complementary and supplementary angles. Use angle properties at a point on a straight line and two intersecting straight lines.	Learners should identify angles of various sizes. Learners should use angle properties to find unknown angles.	Find the letter angles given Using angles at a point or intercepting. (i)  100^0 (ii  a $140^0 50^0$ a 60^0 90^0 b Classify the following angles: $26^{0,}$ 270^0, 90^0, 148^0,320^0, Give one (i) complement (iii) Supplement of 42^0, 87^0	

Senior Secondary II: Mathematics, **Term:** 1

Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 5		Explain and illustrate alternate, corresponding and interior opposite, co-interior angles and their properties.	Learners should be able to locate alternate corresponding and interior opposite angles and apply their properties.	Find the values of a, b, and c using interception parallel lines  	
Plane Geometry Week 6-8	**Angles and intercepts on parallel lines**	Explain the intercept theorem.	Learners should be able to set up ratios of corresponding segments	Use the diagram to explain the intercept theorem  	

Senior Secondary II: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
				$\frac{AB}{BC} - \frac{DE}{EF}$ 	
Plane Geometry Week 9	**Triangles and polygons**	Distinguish between interior exterior and interior opposite angles. Explain and illustrate the forms of	Learners should be able to apply basic arithmetic to solve problems. Learners should be able to apply the congruency	Using the properties of angels, Find the angles a,b, c and d. d  (ii) Is C=a +48^0 If so, why?	

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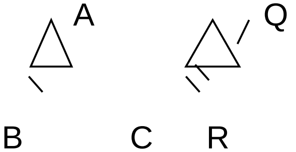
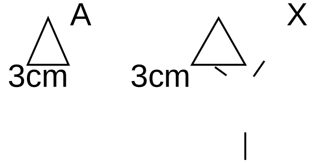
		congruency SAS, SSS etc,	conditions to give pairs of triangles.	Using the example below, state other condition of congruency.  $\triangle$ ABC $\cong$ PQR (SAS)	
Plane Geometry Week 10		Outline properties of isosceles, equilateral and right-angled triangles.	Learners should be able to identify the properties to determine triangle type.	Use the example below to give other examples of triangles.	
Plane Geometry		Outline properties of isosceles, equilateral, right angle triangles, parallelogram, rhombus, square, rectangle and trapezium.	Learners should be able to identify the properties and determine the type of quadrilateral.	 Isosceles Equilateral	

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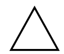
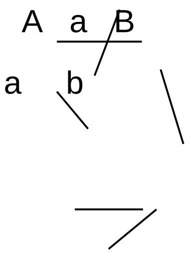
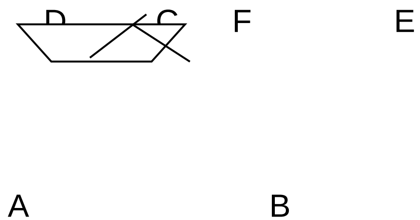
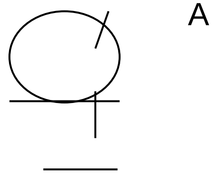
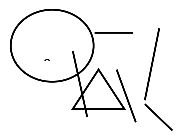
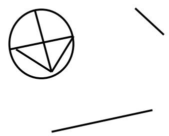
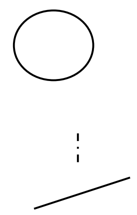
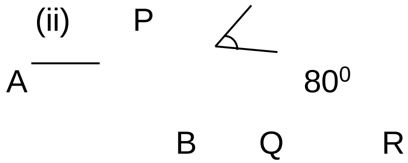
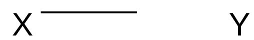
Week 11 **Plane Geometry**		Explain and illustrate properties of similar triangle. Distinguish between sum of the interior angles (2n - 4) right angles and the sum of the exterior angles (4 right angles) of a polygon.	Learners should be able to apply similarity properties to given pairs of triangles. Learners should be able to identify the number of interior or exterior angels and calculate their sum. Learners should be able to identify same base, and the same parallels.	Use these examples to illustrate the other grad lateral  Parallelograms Thrombus trapezium A numerical values to illustrate simple triangles.  A D E$\frac{AB}{AD} = \frac{AC}{AE} = \frac{BC}{DF}$ B C	

Senior Secondary II: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 12		Explain the theorem parallelogram on the same base and between the same parallels are equal in area. Explain the terms centre radius chord, diameter are circumference the perpendicular bisector of a chord, remaining part of the circumference of a circle.	Learners should be able to identify the parts of a circle. Learners should be able to identify subtended angles at the centre and on the circumference.	Use a named polygon to illustrate the formula (2m -4)  n=6 a+b+c+d+e+f =(2(6) -4) x90^0 a"+b"+c+d+e+f=4(90) =360^0 Draw diagrams to illustrate parallelogram on the same case and between to same parallels 	

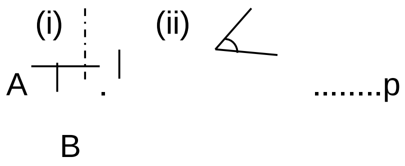
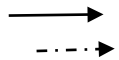
Senior Secondary II: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
		Explain how an angle is subtended at a point by an ace and by a diameter.		ABCD= ABEF Use the definitions and this diagram to name the following parts. A B  use the diagram to illustrate subtended angles  C is subtended by........ at	

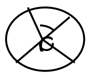
Senior Secondary II: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
				b is subtended by x zat C=Ka, Find K	
	Circles	Explain the terms segment, same segment, opposite segments, tangent and alternate segment.	Learner should be able to identify angles: same, opposite and alternate segments and apply the theorems.	use comprise the some, apposite and alternate segment  Complete the statement: a and b are in the ...... segments	

Senior Secondary II: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
		Illustrate the perpendicularity of radius and tangent at point of contact.	Learners should be able to identify the right angle at the point of contact.	b and c are in the ...... segments d and e are in the ...... segments AX is a....... to the circle from ABCD is a......quadrilateral  Use pair of comprises to bisect	

Senior Secondary II: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 1-2	**Construction**	Explain and illustrate the use of pair of compasses. Demonstrate the bisection of an angle and a line segment using a pair of compasses.	Learners should be able to bisect a given angle and line segment and confirm their result using protractor and divider.	(ii)  Construct a line through P (i) Parallel (ii) Perpendicular to XY 	
Week 3-4		Demonstrate how a line is constructed parallel and perpendicular to a give line.	Learners should be able to construct lines parallel and perpendicular to a given line and confirm their results.		

Senior Secondary II: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 5-6		Construct angles of 90^0 and 60^0. Bisect 90^0 and 60^0 to construct 45^0 and 30^0 respectively. Illustrate combinations of angles and their bisectors: $75=60^0+15^0=90^0+15^0$ $=135=90^0+45^0$	Learners should be able to construct the common angles, their bisector, and their combinations.	Construct the following angles using a pair of compasses: (i)120^0 (ii)150^0 (iii) 22½ (iv)15^0	

Senior Secondary II: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 7-8	**Loci**	Interpret Loci as a type of construction. Points at a given distance from a given point (Circle). Points equidistant from two given points (perpendicular bisector). Points equidistant from two given straight lines (bisector of the angle between them or the	Learners should be able to apply the principles of relevant constructions.	By interpreting loci: Give the appropriate locus of P.  Interpret the loci below. (i) 	

Senior Secondary II: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
		perpendicular bisector of their common perpendicular). Points at a given distance from a given straight line (Straight line parallel to a given straight line)			
Statistics and probability Week 9-10	**Statistics**	Use pictograms, bar and pie chart to present data	Learners should be able to draw inferences from pictograms, bar and pie charts.	Use sectoral angles to solve the problem  Marks scored (out of 100) by four students, what was the highest mark scored?	

Senior Secondary II: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
			Learners should be able to construct pictogram, bar and pie charts from given data. Learners should be able to use tallying to set up frequency tables.	Use graph paper Team: A, B, C, D, E, F, G No of goals: 5, 7, 10, 12, 6, 8, 2 Represent the data by a bar chart. Apply the use of tally marks. Construct a discrete frequency table for: 2,3,5,4,3,8,1,5,4 6,5,8,1,5,9,3,8,5 2,5,3,8,2,3,6	

Team	A	B	C	D	E	F	G
No of goals	5	7	10	12	6	8	2

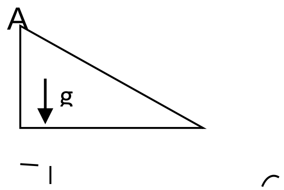
End of year goals: At the end of SSS 3, learners should be able to use trig ratios to solve right angle triangles, and sine and cosine rules to calculate distances and angles, manipulate and represent bearings and calculate areas and volumes of regular shapes and figures.

Senior Secondary III: Mathematics, **Term: 1**					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
Statistics and probability Week 1	**Statistics**	Construct and interpret pictograms, bar and pie charts. Use appropriate methods of tabulation to construct frequency distribution tables.	**Learners should** be able to construct histogram and from it estimate the mode of the data. Learners should be able to determine, mean, median and mode.	**Use tally numbers to** Construct a grouped frequency table using intervals 1-2, 3-4, 5-6, etc. Find the mode, median andmeanfrom your discrete frequency table. Calculate the mean from your grouped frequency table. With class boundaries Use your grouped distribution to construct an ogive. Use suitable example to calculate the range, semi interquartile range from the distribution above.	

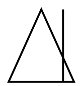
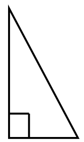
Senior Secondary III: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
Week 2		**Construct and** interpret histogram from equal class intervals estimate mode from it. Calculate mean, median and mode for discrete data and mean for grouped data.	Learners should be able to construct an give and from it. Find estimates for the median quartiles and percentiles. Learners should be able to interpret the measures of dispersion. Learners should be able to apply various	Estimate the semi inter-quartile range from your ogive. Provide appropriate examples to calculate the mean deviation variance and standard deviation using your grouped frequency table. Illustrate the use to p buying cards. A card is chosen at randomfrom a well-shuffled pack of 53 cards. Calulate (i) p(6) (ii) p(k) (iii)P(Q of H) Explain the meaningof afair die A fairdie is thrown once, Find (i) P(3) (ii) P(2 or 6) Illustrate the tossing of a fair coin and explain the possible outcomes. A fair coin is tossed three times, find the probability of all possible outcomes.	

Senior Secondary III: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
Week 3		Construct cumulative frequency curve (ogive) from tabulated data and use it to estimate the median quartiles and percentiles. Understand the concept of measures of dispersion. Find range, semi-inter-quartile, inter-quartile range for discrete data set.	measures of dispersion. Learners should be familiar with probabilities associated with losing a fair coin toss, throwing a fair die, and a well-shuffled pack of playing cards.		

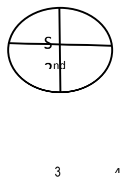
Senior Secondary III: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
Week 4		Estimate semi-inter-quartile/ inter-quartile range from cumulative frequency curve.	Learners should know the difference between mutually exclusive and independent events and interpret ”or”		
Week 5		Understand the use measures of probability from theoretical models (language and scale).	Learners should be able to interpret “and” in independent events.		

Senior Secondary III: Mathematics, **Term: 1**					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
Week 6		Understand and use addition of probabilities for mutually exclusive and independent events. Understand and use multiplication of probabilities for independent events			
Trigonometry Week 7	**Sine, cosine and tangent of acute angles**	Recognise and name sides of a right-angled triangle.	Learner should name sides of a right-angled triangle for a given angle and write ratios of		

Senior Secondary III: Mathematics, **Term: 1**

Theme/ Concept	Topic	Objective	Learning Outcome	Teaching/ Learning Activitites	Teaching and Learning Aids
Week 8		Express sine, cosine and tangent as ratios of two sides. Understand and use sine, cosine, and tangent tables. Express the sine, cosine and tangent of the	sine, cosine and tangent. Learners should be able to read the sine, cosine and tangent of given angles.	B C Use the definitions of triangle ratios to complete sin x = cosx = tan x = sin y = cosy = tan y = Use table to find sin $25,54^0$ = cos $87,72^0$ = tan $63,23^0$ =  	

Senior Secondary III: Mathematics, **Term: 1**

Theme/ Concept	Topic	Objective	Learning Outcome	Teaching/ Learning Activitites	Teaching and Learning Aids
Week 9	**Angles of elevation and depression**	special angleO^0, 30^0, 45^0, 60^0, 90^0 in surd form. Apply ratio of special angles where tables/calculators are prohibited. Understand signs of sine, cosine and tangent for angles O^0 to 360^0 (the four quadrants).	Learners should be able to do calculations involving the special angles without the use of tables or calculators. Learners should be able to recognise the quadrant sign system.	Use definitions of trig ratios to Simplify $\frac{\sin 60}{\sin 30+\cos 60}$ 90^0  180^0 0^0 360^0 3R 270^0 Use the diagram to complete the statement: Sine is positive in ----quadrants Cosine is positive in ----quadrants Tangent is positive in ----quadrants	

<table>
<tr><th colspan="6">Senior Secondary III: Mathematics, Term: 1</th></tr>
<tr><th>Theme/ Concept</th><th>Topic</th><th>Objective</th><th>Learning Outcome</th><th>Teaching/ Learning Activitites</th><th>Teaching and Learning Aids</th></tr>
<tr>
<td>Week 10</td>
<td>Sine and cosine rules

Bearings</td>
<td>Compute table of values for y=sin x, y – cos x.

Draw the graphs of y =sin x and y=cos x using the table of values.</td>
<td>Learners should be able to compute table of values for y – 2 sin x, y = 3 cos x and y = 0.5 tan x and draw their graphs.</td>
<td>Copy and complete the table for y=3 sin x using sine tables.
<table>
<tr><td>x</td><td>0</td><td>30^0</td><td>60^0</td><td>90^0</td><td>120^0</td><td>150^0</td><td>180^0</td></tr>
<tr><td>Sin x</td><td>6</td><td></td><td></td><td>1</td><td></td><td>0.5</td><td></td></tr>
<tr><td>Y =3sin x</td><td>8</td><td></td><td>2.60</td><td>3</td><td></td><td>1.50</td><td></td></tr>
</table>
Using tables of sine and cosine,
copy and complete the table for y=3 sin x.</td>
<td></td>
</tr>
</table>

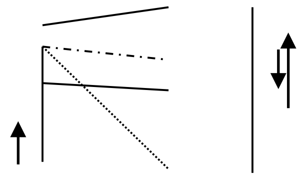
<table>
<tr><th colspan="6">Senior Secondary III: Mathematics, Term: 1</th></tr>
<tr><th>Theme/ Concept</th><th>Topic</th><th>Objective</th><th>Learning Outcome</th><th>Teaching/ Learning Activitites</th><th>Teaching and Learning Aids</th></tr>
<tr>
<td>Week 11</td>
<td></td>
<td>Compute table of values for y=2 sin x to cos x.

Draw the graph of y =2 sin x + cos x.

Solve simultaneous equations of the form:

Y=2+3x and</td>
<td>Learners should be able to compute table of value for sum or difference of trig ratios and draw their graph.

Learners should apply the method of</td>
<td>
<table>
<tr><td>x</td><td>0</td><td>30^0</td><td>60^0</td><td>90^0</td><td>120^0</td></tr>
<tr><td>Sin x</td><td>6</td><td></td><td></td><td>1</td><td></td></tr>
<tr><td></td><td>8</td><td></td><td></td><td>3</td><td></td></tr>
<tr><td>Y =3sin x2 cos x</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Use the diagram to relate object observed positions depression

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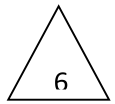
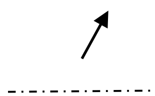
</table>

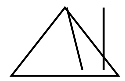
Senior Secondary III: Mathematics, **Term: 1**					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
Week 12		Y = 2sinx +cos x Understand and distinguish between angles of elevation and depression. Calculate heights, distances of angles of elevation and depression.	graphs of simultaneous equations one quadratic, one linear. Learners should know the object-observer relationship elevation (object at higher level) depression (object at lower level).	 Find the angle of (i) Elevation of T (ii) Depression of F Using triangle ratios	

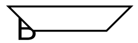
Senior Secondary III: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
Week 13		Understand and use the sine rule $(\frac{a}{\sin A} - \frac{b}{\sin B} = \frac{C}{\sin C})$ and cosine rule:	Learner should be able to use simple trig ratios to determine required sides and angles.	6cm x 60 Find the values of x and o using cosine and sine rules. Convert bearing from one from to the other. 360^0 E $=120^0$ $\therefore$ N30^0 W = ... 250^0 = S – W 008^0 = N -^{0} -N N 	

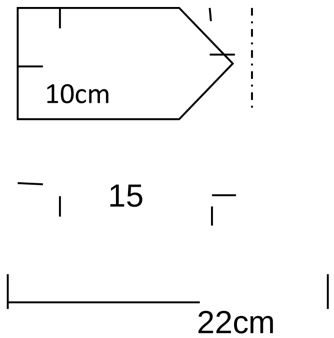
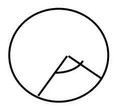
Senior Secondary III: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
		$A^2 = b^2 + C^2 - 2bc \cos A$ Understand the notion and types of bearings (mariners compass and military – 3 figures notation). Understand the bearing of a point is taken from a reference point.	Learners should be able to identify the lengths (a,b,c,) and the angles (A,B,C) and use them in calculation. Learners should be able to convert from compass to military and vice versa.	The bearing of B from A is N60^0 E, what is the bearing of A from B? Use the 3 figure notation. Y is 100m east of X, Z is 80m from Y on a bearing 330^0. Find Find (i) the distance x z (iii) The bearing of z from X. Using the sine rule.	

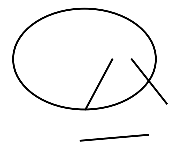
Senior Secondary III: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objective**	**Learning Outcome**	**Teaching/ Learning Activitites**	**Teaching and Learning Aids**
		Calculate distance and angles.	Learners should be able to locate the bearing of one point from another. Learner should apply basic trig to calculate distances and angles.		

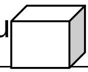
Senior Secondary III: Mathematics, **Term:** 2

Theme/ Concept	Topic	Objectives	Learning outcome	Suggested Teaching/Learning Activities	Teaching and Learning Aids
Week 1-2	**Length and perimeters.**	**Understand and use Pythagoras theorem in two dimensions.**	Learners should be able to calculate one side of right-angled triangle when the other two are given.	a. In $\triangle$ ABC, <ABC = 90^0 AB = 4.5cm and AC = 12.5cm. Calculate in cm the length BC, using Pythagoras theorem.  Use Pythagoras theorem to calculate in cm, the length (i) CN (ii) AC (iii) DB	
Week 3-4	**Areas of plane shapes**	**Find the area of simple shapes using formulae** $\triangle$	Learners should be able to use formulae to calculate	Find in Cm^2 using appropriate formula the areas of (i) $\triangle$ (ii) ABC in the figure above	

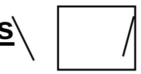
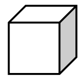
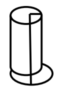
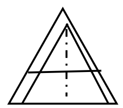
Senior Secondary III: Mathematics, **Term:** 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**	**Teaching and Learning Aids**
		=½ base is height, ▱ **= base is height** ⏢ **=½(a+b)n**	areas of simple and compound plane figures.	. 6cm (b)  B C 12cm Use appropriate formulae to calculate: (i)The area of $\triangle$ ACD (ii) The height of ABCD if its area is 36cm^2. (c) Use areas of plane figure to find areas of compute figures.	

Senior Secondary III: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 5-6		**Circle -** πr^2 **Sector** $-\frac{\pi r^2 x^0}{360^0}$ segment- sector – triangle.	Learners should be able to use standard formulae to calculate areas of regular plane shapes.	 In the figure below, use appropriate formulae to find the areas of (i) Circular centre O (ii) Sector AOB (iii) Shaded Region 	

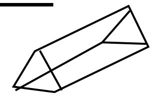
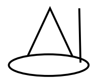
Senior Secondary III: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 7-8		Find the length of the chord of a circle.	Learners should be able to calculate the length of the chord of a circle using trigonometry or the cosine rule.	Use relevant formulae to calculate the length of a chord of a circle.  Length of chord AB = 2rs in $\frac{0}{2}$ or length of chord AB $\sqrt{2r^{2(1-\text{cose })}}$ Use diagrams to illustrate perimeter as distance round in area.	

Senior Secondary III: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 9-10		Find the length of arcs of circles, perimeter of sector, and segments	Learners should be able to use formulae to calculate use length of arcs of	(i) Length of are ABC $=\frac{0}{360}$ x 2nr (ii) Perimeter of sector = 2r + length of arc (iii) Perimeter of segment = length of arc +length of chord Give pupils practice in determining the following solids using the formulae below: **<u>Cubes</u>** Su  area =$6L^2$	

Senior Secondary III: Mathematics, **Term:** 2

Theme/ Concept	Topic	Objectives	Learning outcome	Suggested Teaching/Learning Activities	Teaching and Learning Aids
		using the appropriate formulae. Understand and recognize the use of terms face edge and vertex in the context of a three dimensional solid. Find the total surface area of the following using the appropriate formulae(Cubes, cuboids cylinders, cores, pyramids right triangular prism and spheres).	circles, perimeters of sectors, and segments. Learners should be able to use the terms fall, edge and vertex in the context of three dimensional solid. Learners should be able to use appropriate formulae to calculate the surface area of the following (cubes, cuboids, cylinders, right triangular prisms, cores and spheres).	**<u>Cuboids</u>**   Surface area = (1b+lb +bh) **Pyramids**  surface area 2ƛ (r +h) Curved surfaces are **<u>Triangular Prism</u>** 	

Senior Secondary III: Mathematics, **Term:** 2

Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 11-12		Find the volumes of cubes cuboids, cylinders, core right pyramids and spheres using the appropriate formula	Learners should be able to use appropriate formulae to calculate the volumes of cubes, cuboids, cylinders, core right pyramids and spheres.	Surface area =Area of triangular face +Area of base **<u>Prism</u>**  Surface area2(area of triangle) +3(area of rectangle) **<u>CONE</u>**  H curved surface area = πrl	

Senior Secondary III: Mathematics, **Term:** 2

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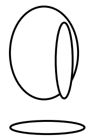
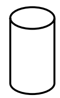
				Surface area = = $\pi($ r+l) Sphere  Surface area =4 $\pi\ r^2$ Hemisphere 	

Senior Secondary III: Mathematics, Term: 2					
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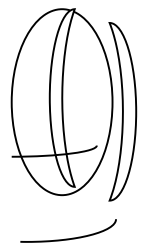
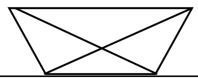
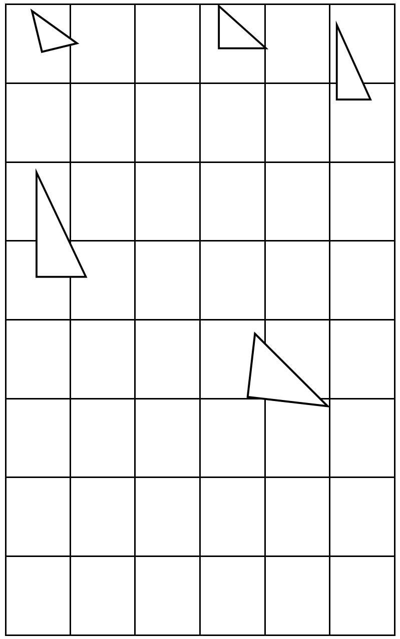
				Curved surface area =2 πr 2 Surface area =3 πr 2 Give pupils practice in determining the volumes of the following solids using below: Volume =Lx L x L =L^3 Cuboids = volumes = Lx B x H Cylinder volumes =πr^2h	

Senior Secondary III: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Suggested Teaching/Learning Activities**	**Teaching and Learning Aids**
				Pyramid volume $=\frac{1}{3}\ x\ base\ area\ x\ height$ Cone volume $==\frac{1}{3}\ \pi r^3$ Hemisphere Volume $=\frac{2}{3}\ \pi r^3$	

<table>
<tr><th colspan="6">Senior Secondary IV: Mathematics, Term: 1</th></tr>
<tr><th>Theme/ Concept</th><th>Topic</th><th>Objectives</th><th>Learning outcome</th><th>Teaching/Learning Activities</th><th>Teaching and Learning Aids</th></tr>
<tr><td>Measurement
Week 1-3</td><td>Volume of similar solids</td><td>Understand that volumes of similar solids are in the ratio of the cubes of their corresponding sides.</td><td>Learners should be able to apply ratios to calculate volumes of similar sides.</td><td>Use ratios to find the mising values.<table>
<tr><td></td><td>Cone A</td><td>Cone B</td></tr>
<tr><td>Radius</td><td>2cm</td><td>4cm</td></tr>
<tr><td>Height</td><td>6cm</td><td>x</td></tr>
<tr><td>Volume</td><td>Y</td><td>$168cm^2$\</td></tr>
</table>If A and B are similar, find X and Y.</td><td></td></tr>
<tr><td>Week 4-5</td><td>Longitudes and Latitudes</td><td>Distinguish between longitudes and latitudes.</td><td>Learners should be able to known the latitudes range from $0^0 – 90^0$ N,
$0^0 – 90^0$S of the equator, longitudes range from 0^0 - 180^0 W, $0^0 – 180^0$E of the Prime (Greenwich) Meridian.</td><td>Use addition or subtraction for the points A(70^0S, 30^0W), D(50^0N,70^0E) to complete the following:
Sectorial angle pg arc AB=............</td><td></td></tr>
</table>

Senior Secondary IV: Mathematics, **Term:** 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
		Determine the angle between two points on the some latitude or same longitude.	Learners should be able to recognise latitudes in same or opposite hemispheres and longitudes West or East of the Prime Meridian	Sectorial angle pg arc BC=........... Sectorial angle pg arc CD=........... Use arc length to calculate the distance betwen (i) BC (ii) AB 	
Week 6-7	**Vectors and transformation**	Understand that a vector has both magnitude and direction.	Learners should be able to write and recognise displacement and position vectors.	Use vector/definition algebra to find the following: 	

Senior Secondary IV: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Week 8-9		Understand use vector notations. Manipulate vectors using addition, subtraction and scalar multiplication. Calculate the magnitude of a vector. Understand that reflection is specified by a mirror line and preserves both length and angles.	Learners should be able to perform basic addition, subtraction and scalar multiplication of vectors. Learners should be able to find the magnitude of vectors. Learners should be able to determine and use mirror lines (symmetry). Learners should be able to determine and use angle	$\frac{AC}{BC}$ = $\frac{B}{\rightarrow}$ = AB +BC = b) OA =2 +3 →→ Find (i)OA +20B →→ (ii) 30A +20c → (iii)lOAl	

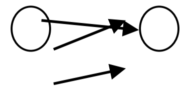
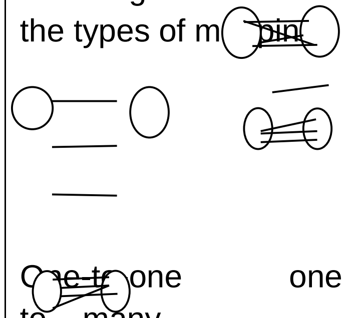
Senior Secondary IV: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Coordinate Geometry of straight line Week 10-11		Understand that rotation is specified by a centre and an angle and preserves both length and angle. Understand that translation is specified by distance and direction and preserves both length and angles. Understand that enlargement is specified by a centre and scale and preserves angles but not length.	of rotation about the origin or a given point. Learners should be able to determine and use translation vectors. Learners should be able to determine and use scale factors with or without a given centre. Learners should be able to recognise transformation patterns. Learners should be able to identify and use	Use the transformation studied 	

Senior Secondary IV: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
		Identify and give complete description of transformations. Understand concept of the X-Y-plane. Understand and use the coordinates in the four (4) quadrants to determine: (a) Coordinate of the midpoint of two points.	coordinates as they appear in the four (4) quadrants. Learner should be able to calculate, with two points given, the coordinate midpoint of two points using the formula. Learners should be able to calculate the distance between two points using the formula.	To describe fully the single transformation which maps AP onto Ap, Ar, Ab and AT. Give pupils series of exercise in determining coordinates in the four quadrants. ^{-}x ^{-}y (4,3) – 1st quadrant ($^{-}2$, 5) – 2nd quadrant	

Senior Secondary IV: Mathematics, **Term:** 1

Theme/ Concept	Topic	Objectives	Learning outcome	Teaching/Learning Activities	Teaching and Learning Aids
		(b) Distance between two points. (c) Gradient (slope) of a line (d) Equation of a straight line	Learners should be able to calculate the gradient (Slope) of a line using the formula. Learners should be able to determine the equation of a straight line using the gradient and the coordinate of midpoint. Learners should be able to determine the equation of	(-1, -6) – 3rd quadrant (3,-4) – 4th quadrant Give pupils practice in determining the midpoint, gradient and equation of a straight line using the formulae below: A(X_1, Y_1) and B(x_2,Y_2) Midpoint of AB= ($\frac{x+x,}{2}$, $\frac{Y+Y}{2}$) AB=$\sqrt{(x - x_1) +(Y_2 - Y^2)}$ or	

Senior Secondary IV: Mathematics, Term: 1					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
		Equation of a straight line.	a straight line using the gradient and one point.	AB=$\sqrt{(X \quad + X \quad)^2 + (Y_2 - Y_1)^2}$ Grad m =$\frac{y-y}{X-x}$ or $\frac{y-y}{x-x}$ <u>Equation of a straight line:</u> Y – y_1 = (x – x_1) Where m = gradient (x_1, y_1) = coordinate of midpoint. Y = mx + c M = gradient C = constant	

Senior Secondary IV: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
Algebraic processes Week 1-3 Week 4-5	**Functions and relations**	Understand a function as a mapping between elements of two sets. Use functions notations. Understand the meaning of one –to-one, one –to many -many –to one and many –to –many.	Learners should be able to read and interpret the notations. $F(x) = ax + b$ and $f: x \to (ax + b)$ Learners should be able to identify the types of mappings.	Use diagrams to illustrate mapping  A B Use diagrams to illustrate the types of mapping  One-to-one one –to – many Use examples to differentiate domain as set of first (x) coordinate and	

Senior Secondary IV: Mathematics, Term: 2					
Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
		Distinguish between domain and range of a function. Determine a rule from a given mapping/function.	Learners should be able to identify domains and ranges. Learners should be able to deduce the rule governing a given mapping/function.	ranges as a set of the second (y) coordinates. (i)F(x)= X^2 +2; (-2≤x ≤10) Domain =(-2≤x≤10) Range (2≤y≤102) (ii) g(x)=$\frac{8}{x+2;}$; x>-2 Domain {-2<x<0} Range ={y>0}	
Numbers and numeration Week 6-7	**Logical reasoning**	Understand and identity valid and identify valid and non-valid statements.	Learners should be able to determine true and false statements using the symbols and from Venn diagrams	Explain a statement as a propostion which is true or false but not both.	

<table>
<tr><th colspan="6">Senior Secondary IV: Mathematics, Term: 2</th></tr>
<tr><th>Theme/ Concept</th><th>Topic</th><th>Objectives</th><th>Learning outcome</th><th>Teaching/Learning Activities</th><th>Teaching and Learning Aids</th></tr>
<tr><td></td><td></td><td>Use symbols to deduce validity of statement.

Deduce valid statements from Venn-diagrams</td><td></td><td>Explain the symbol $\Rightarrow$ (imples) and (is $\Leftarrow$ impled by) and that P $\Rightarrow$ Q is valid except when P is tru and q is false

(iii) (not) or the negation = if P is true then P is false are vice versa.

<table>
<tr><th>P</th><th>Q</th><th>P $\Rightarrow$ Q</th><th>P $\Leftarrow$ Q</th><th>-P</th></tr>
<tr><td>T</td><td>T</td><td>T</td><td>T</td><td>F</td></tr>
<tr><td>T</td><td>F</td><td>F</td><td>T</td><td>F</td></tr>
<tr><td>F</td><td>T</td><td>T</td><td>F</td><td>T</td></tr>
<tr><td>F</td><td>F</td><td>T</td><td>T</td><td>T</td></tr>
</table></td><td></td></tr>
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Theme/ Concept	**Topic**	**Objectives**	**Learning outcome**	**Teaching/Learning Activities**	**Teaching and Learning Aids**
				GIVE example involving deductive statement from Venndiagrams.	
Revision Week 8-10	**All previously taught topics**	Demonstrate an understanding of topics previously introduced during Term 1 and Term 2.	Learners should be able to demonstrate their understanding by solving equations using strategies previously taught.		

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