



PROVINCE OF THE
EASTERN CAPE
EDUCATION

DIRECTORATE:
CURRICULUM FET PROGRAMMES
LESSON PLANS
TERM 4
MATHEMATICS
GRADE 10

FOREWORD

The following Grade 10, 11 and 12 Lesson Plans were developed by Subject Advisors during May 2009. Teachers are requested to look at them, modify them where necessary to suit their contexts and resources. It must be remembered that Lesson Plans are working documents, and any comments to improve the lesson plans in this document will be appreciated. Teachers are urged to use this document with the following departmental policy documents: Subject Statement; LPG 2008; SAG 2008; Examination Guidelines 2009 and Provincial CASS Policy / Guidelines.

Lesson planning is the duty of each and every individual teacher but it helps when teachers sometimes plan together as a group. This interaction not only helps teachers to understand how to apply the Learning Outcomes (LOs) and Assessment Standards (ASs) but also builds up the confidence of the teachers in handling the content using new teaching strategies.

It must please be noted that in order to help teachers who teach across grades and subjects, an attempt has been made to **standardise lesson plan templates** and thus the new template might not resemble the templates used in each subject during the NCS training. However, all the essential elements of a lesson plan have been retained. This change has been made to assist teachers and lighten their administrative load.

Please note that these lesson plans are to be used only as a guide to complete the requirements of the Curriculum Statements and the work schedules and teachers are encouraged to develop their own learner activities to supplement and /or substitute some of the activities given here (depending on the school environment, number and type of learners in your class, the resources available to your learners, etc).

Do not forget to build in the tasks for the Programme of Assessment into your Lesson Plans.

Strengthen your efforts by supporting each other in clusters and share ideas. Good Luck with your endeavours to improve Teaching, Learning and Assessment.

SUBJECT: MATHEMATICS**GRADE 10****LESSON PLAN 1****TIME : 9 HOURS**

Context: Mathematical, Sciences and Engineering .

Link with previous lesson: Linear, and trigonometric, and other form of graphs

KNOWLEDGE (K): Sketching of graphs by using applicable characteristics

SKILLS (S): Identify the characteristics of graphs; sketch graphs by plotting the key points (using intercepts, turning points etc.)

VALUES (V): Appreciation of graphs in real life situations.

Learning Outcome 1: Number and Number Relationships <i>When solving problems, the learner is able to recognise, describe, represent and work confidently with numbers and their relationships to estimate, calculate and check solutions.</i>		Learning Outcome 2: Functions and Algebra <i>The learner is able to investigate, analyse, describe and represent a wide range of functions and solve related problems.</i>		Learning Outcome 3: Space, Shape and Measurement <i>The learner is able to describe, represent, analyse and explain properties of shapes in 2-dimensional and 3-dimensional space with justification.</i>		Learning Outcome 4: Data Handling and Probability <i>The learner is able to collect, organise, analyse and interpret data to establish statistical and probability models to solve related problems.</i>	
10.1.1 Identify rational numbers and convert between terminating or recurring decimals		10.2.1 a) Demonstrate the ability to work with various types of functions, including those listed in the following Assessment Standard. (b) Recognise relationships between variables in terms of numerical, graphical, verbal and symbolic representations and convert flexibly between these representations (tables, graphs, words and formulae).		10.3.1 Understand and determine the effect on the volume and surface area of right prisms and cylinders, of multiplying any dimension by a constant factor k.		10.4.1 Collect, organize and interpret data determine: measures of central tendency measures of dispersion: Represent data effectively, choosing appropriately from:	
10.1.2 Simplify expressions using the laws of exponents		10.2.2 Generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence to generalise the effects of the parameters a and q on the graphs of functions including:		10.3.2 Through investigations, produce conjectures and generalisations			
10.1.3 Investigate number patterns		10.2.3 Identify characteristics as listed below and hence use applicable characteristics to sketch graphs of functions (graphs listed in 10.2.2)	√	10.3.3 Represent geometric figures on a Cartesian co-ordinate system, and derive and apply, for any two points			

10.1.4 Use simple and compound growth formulae		10.2.4 Manipulate algebraic expressions		10.3.4 Investigate, generalise and apply the effect of the following transformations of the point (x; y):			
10.1.5 Demonstrate an understanding of the implications of fluctuating foreign exchange rates		10.2.5 Solve: (a) linear equations (b) quadratic equations by factorisation (c) exponential equations (d) linear inequalities in one variable and illustrate the solution graphically		10.3.5 Understand that the similarity of triangles is fundamental to the trigonometric functions			
10.1.6 Solve non-routine, unseen problems.		10.2.6 Use mathematical models to invest problems that arise in real-life contexts:		10.3.6 Solve problems in two dimensions by using the trigonometric functions			
		10.2.7 Investigate the average rate of change of a function between two values of the independent variable,					

TEACHING ACTIVITIES	LEARNERS ACTIVITIES	RESOURCES	ASSESSMENT	DATE COMPLETED
ACTIVITY 1 Teacher provides worksheets with equations of functions of the following form: (Linear, quadratic, hyperbola, and exponential.) $y = ax + q$; $y = ax^2 + q$	Learners will complete the work sheets by finding the following: (a) domain and range; (b) intercepts with the axes; (c) turning points, minima and maxima; (d) asymptotes; (e) shape and symmetry; (f) intervals on which the function increases/decreases;	Worksheets, graph papers text books, calculators.	Class work, Home work, memo , check list, Peer, Self and educator	

$y = \frac{a}{x} + q$ $y = ab^x + q, b > 0$ They will be given guidance Teaching Methods: Discussion, discovery, observation, question and answer.	(g) the discrete or continuous nature of the graph. Learners use the above information to sketch the graphs (Not point by point plotting)			
ACTIVITY 2 Teacher provides worksheets and graph papers with equations of trigonometric functions of the following form: $y = a \sin x + q$ $y = a \cos x + q$ $y = a \tan x + q$ with interval $[0^\circ; 360^\circ]$ Teaching Methods: Discussion, discovery, observation, question and answer	Learners will complete the work sheets by finding the following: (a) domain and range; (b) intercepts with the axes; (c) turning points, minima and maxima; (d) asymptotes; (e) shape and symmetry; (f) intervals on which the function increases/decreases; (g) the discrete or continuous nature of the graph. (h) periodicity and amplitude Learners use the above information to sketch the graphs on graph papers (Not point by point plotting)	Worksheets, graph papers text books, calculators.	Class work, Home work, Assignment. memo , check list, Peer, Self and educator	

Homework: Exercises given from selected text books and various resource materials
Enrichment/Expanded Opportunities: sketching of all types of graphs. Application of knowledge in solving problems in Physical sciences, Life Sciences, Geography etc,
Teacher Reflections:

SIGNATURES:

TEACHER

DATE

HOD / SMT

DATE

SUBJECT: MATHEMATICS		GRADE 10		LESSON PLAN 2		TIME : 13½ HOURS	
REVISION FOR EXAMINATIONS							
Learning Outcome 1: Number and Number Relationships <i>When solving problems, the learner is able to recognise, describe, represent and work confidently with numbers and their relationships to estimate, calculate and check solutions.</i>		Learning Outcome 2: Functions and Algebra <i>The learner is able to investigate, analyse, describe and represent a wide range of functions and solve related problems.</i>		Learning Outcome 3: Space, Shape and Measurement <i>The learner is able to describe, represent, analyse and explain properties of shapes in 2-dimensional and 3-dimensional space with justification.</i>		Learning Outcome 4: Data Handling and Probability <i>The learner is able to collect, organise, analyse and interpret data to establish statistical and probability models to solve related problems.</i>	
10.1.1 Identify rational numbers and convert between terminating or recurring decimals	√	10.2.1 a) Demonstrate the ability to work with various types of functions, including those listed in the following Assessment Standard. (b) Recognise relationships between variables in terms of numerical, graphical, verbal and symbolic representations and convert flexibly between these representations (tables, graphs, words and formulae).	√	10.3.1 Understand and determine the effect on the volume and surface area of right prisms and cylinders, of multiplying any dimension by a constant factor k.	√	10.4.1 Collect, organize and interpret data determine: measures of central tendency measures of dispersion: Represent data effectively, choosing appropriately from:	√
10.1.2 Simplify expressions using the laws of exponents	√	10.2.2 Generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence to generalise the effects of the parameters <i>a</i> and <i>q</i> on the graphs of functions including:	√	10.3.2 Through investigations, produce conjectures and generalisations	√		
10.1.3 Investigate number patterns	√	10.2.3 Identify characteristics as listed below and hence use applicable characteristics to sketch graphs of functions	√	10.3.3 Represent geometric figures on a Cartesian co-ordinate system, and derive and apply, for any two points	√		
10.1.4 Use simple and compound growth formulae	√	10.2.4 Manipulate algebraic expressions	√	10.3.4 Investigate, generalise and apply the effect of the following transformations of the point (<i>x</i> : <i>y</i>):	√		

10.1.5 Demonstrate an understanding of the implications of fluctuating foreign exchange rates	√	10.2.5 Solve: (a) linear equations (b) quadratic equations by factorisation (c) exponential equations (d) linear inequalities in one variable and illustrate the solution graphically	√	10.3.5 Understand that the similarity of triangles is fundamental to the trigonometric functions	√		
10.1.6 Solve non-routine, unseen problems.	√	10.2.6 Use mathematical models to invest problems that arise in real-life contexts:	√	10.3.6 Solve problems in two dimensions by using the trigonometric functions	√		
		10.2.7 Investigate the average rate of change of a function between two values of the independent variable,	√	10.3.7 Demonstrate an appreciation of the contributions to the history of the development and use of geometry and trigonometry by various cultures through a project			

TEACHING ACTIVITIES	LEARNERS ACTIVITIES	RESOURCES	ASSESSMENT	DATE COMPLETED
<p>ACTIVITY 1 (one week)</p> <p>Review all LO,S and assessment standards</p> <p>Teacher gives exam tips and skills on answering</p> <p>TEACHING METHODS</p> <p>Discussion, question and answer, group work</p>	Discussions in groups on all topics in each Learning Outcome per day.	Text books, study guides, Calculators, graph papers.	<p>Class work and short test</p> <p>Memo.</p> <p>Peer and educator</p>	

<p>ACTIVITY 2 (one week)</p> <p>Revise paper 1</p> <p>TEACHING METHODS</p> <p>Discussion, question and answer, group work</p>	<p>Learners work out answers from question papers as individuals and in groups</p>	<p>Paper 1 exemplars, past exam papers study guides, study mates etc.</p> <p>Calculators, graph papers.</p>	<p>Short tests home work , class work and tutorials</p>	
<p>ACTIVITY 3 (one week)</p> <p>Revise paper 2</p> <p>TEACHING METHODS</p> <p>Discussion, question and answer, group work</p>	<p>Learners work out answers from question papers as individuals and in groups</p>	<p>Paper 2 exemplars, past exam papers study guides, study mates etc.</p> <p>Calculators, graph papers.</p>	<p>Short tests home work , class work and tutorials</p>	
Homework: Exercises given from selected textbooks and various resource material like exemplars, past question papers				
Enrichment/Expanded Opportunities: More challenging questions				
Teacher Reflections:				

SIGNATURES:

TEACHER

DATE

HOD / SMT

DATE