No. 296 ***5*** April ***2007***

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with Regulation 24(c) of the Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Math Literacy, Math and Math Sciences

registered by Organising Field 10, Physical, Mathematical, Computer and Life Sciences, publishes the following unit standards for public comment.

This notice contains the titles, fields, subfields, NQF levels, credits, and purpose of the unit standards. The full unit standards can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address below ***and no*** later ***than 4*** May ***2007.*** All correspondence should be marked Standards Setting – Math Literacy, Math **and** Math Sciences addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Solve absolute value equations, rational equations and rational inequalities in the real number system and equations of second and third degree in the complex number system

SAQA US ID	*UNIT STANDARD TITLE*		
243827	Solve absolute value equations, rational equations and rational inequalities in the real number system and equations of second and third degree in the complex number system		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L **2 -4**			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	4

SPECIFIC OUTCOME 1
Determine the real and complex roots of quadratic and cubic equations

SPECIFIC OUTCOME 2
Draw and work with absolute value graphs

SPECIFIC OUTCOME 3
Solve simple absolute value equations

SPECIFIC OUTCOME 4
Solve rational equations and inequalities.

SAQA US ID	UNIT STANDARD TITLE		
243830	Find the probability of events using different probability models		
SGB		PROVIDER	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 -Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 3	4

SPECIFIC OUTCOME 1
Calculate the probability of conditional events

SPECIFIC OUTCOME 2
Develop counting techniques.

SPECIFIC OUTCOME 3
Identify and use the distribution models to calculate probability

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Describe statistics as found in real life and evaluate probability

SAQA US *ID*	UNIT STANDARD TITLE		
243834	Describe statistics as found in real life and evaluate probability		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 - Phvsical. Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD NPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 2	6

SPECIFIC OUTCOME 1
Identify and analyse grouped and ungrouped data

SPECIFIC OUTCOME *2*
Solve problems involving probability using diagrams

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SAQA US ID	UNIT STANDARD TITLE		
243835	Understand linear relationships and predicting linear trends using appropriate models		
SGB		PROVIDER	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	2

SPECIFIC OUTCOME 1
Formulate a probability mass and density function,

SPECIFIC OUTCOME 2
Establish a Confidence Interval for a set of data using statistical tables.

SPECIFIC OUTCOME 3
Perform a one-tail and/or two-tail hypothesis test

SPECIFIC OUTCOME 4
Generate a predictive model using linear regression and correlation

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SAQA US ID	UNIT STANDARD TITLE		
243839	Develop techniques to estimate the areas of different **shapes** and apply them in practical and mathematical contexts		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Saences	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 2	2

SPECIFIC OUTCOME 1
Use problem-solving methods to calculate the areas of regular and irregular shapes

SPECIFIC OUTCOME 2
Develop and use the "Rectangle Method' for approximating the area under curves

SPECIFIC OUTCOME 3
Develop and use the Trapezoidal Rule for approximating area under curves.

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Find the derivatives of a range of simple functions, including the trigonometric functions ***and apply*** them to problems

SAQA US ID	*UNIT STANDARD TITLE*		
243842	Find the derivatives of **a** range of simple functions, including the trigonometric functions and apply them to problems		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	6

SPECIFIC OUTCOME 1
Use first principles and graphs to determine if certain functions are continuous and differentiable in a certain point.

SPECIFIC OUTCOME 2
Determine the first and higher order derivatives of functions using rules

SPECIFIC OUTCOME 3
Use calculus methods to sketch the curves of polynomial and rational functions

SPECIFIC OUTCOME *4*
Use derivatives as a tool to solve problems in real, realistic and abstract mathematical contexts.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Solve simple and compound growth and decay problems using explicit form and difference equations

SAQA US ID	*UNIT STANDARD TITLE*		
243826	Solve simple and compound growth and decay problems using explicit form		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	3

SPECIFIC OUTCOME 1
Solve simple and compound growth and decay problems in various contexts.

SPECIFIC OUTCOME 2
Generalise number patterns using first order linear difference equations ($u_n = k.u_{n-1} + c$) and the accompanying explicit form (general solution).

SPECIFIC OUTCOME 3
Use first order linear difference eauations to solve future value annuities

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SAQA US ID	UNIT STANDARD TITLE		
243820	Model simple and compound growth and decay problems using explicit form and difference equations		
SGB		PROVIDER	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 3	5

SPECIFIC OUTCOME 1
Compare nominal and effective interest rates.

SPECIFIC OUTCOME 2
Calculate aspects of present and future value annuities

SPECIFIC OUTCOME 3
Solve problems involving the future or present value of an annuity.

SPECIFIC OUTCOME 4
Generalise number patterns using second order homogenous linear difference equations ($u_n = p.u_{n-1} + q.u_{n-2}$).

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SAQA US ID	UNIT STANDARD TITLE		
243829	Investigate logarithmic and exponential functions and their graphs and the graphs of rational functions and explore proof by induction		
SGB		PROVIDER	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	4

SPECIFIC OUTCOME 1
Work with the exponential and logarithmic functions (including natural logarithms) and the laws relating to these functions.

SPECIFIC OUTCOME 2
Make graphical representations of exponential and logarithmic functions

SPECIFIC OUTCOME 3
Prove a mathematical proposition by Induction

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Develop the formula for the area under a general curve (Riemann or definite integral) and apply it to polynomial functions for finding areas and volumes

SAQA US ID	UNIT STANDARD TITLE		
243831	Develop the formula for the area under a general curve (Riemann or definite integral) and apply it to polynomial functions for finding areas and volumes		
SGB		PROVIDER	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 - Physical. Mathematical. Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 3	5

SPECIFIC OUTCOME 1
Develop and use the upper and lower sums method for approximating area together with an estimate of the error and use it to derive a formula for the area under $y = x^n$.

SPECIFIC OUTCOME 2
Intuitively develop and define Riemann integral (definite integral) from approximate areas under curves, namely, the limit of a Riemann **Sum.**

SPECIFIC OUTCOME 3
Apply the definite integral in solving area problems.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Develop a variety of techniques to find both indefinite and definite integrals of a range of algebraic and transcendental functions, and apply them to problems

SAQA US ID	*UNIT STANDARD TITLE*		
243832	Develoo a varietv of techniaues to find both indefinite and definite integrals of a range of algebraic and transcendental functions, and apply them to problems		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQFLEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

SPECIFIC OUTCOME 1
Determine the general anti-derivatives of a range of algebraic and transcendental (non-algebraic) functions using various techniques.

SPECIFIC OUTCOME 2
Apply the definite integral in solving area and volume problems

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Manipulate and simplify mathematical statements involving complex numbers, polynomials and rational functions

SAQA US ID	UNIT STANDARD TITLE		
243833	Manipulate and simplify mathematical statements involving complex numbers, polynomials and rational functions		
SGB		PROVIDER	
SGB for Math Literacy, Math, Math Sciences L 2-4			
FIELD		SUBFIELD	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 2	6

SPECIFIC OUTCOME 1
Demonstrate an understanding of the place in Mathematics of the root of negative one.

SPECIFIC OUTCOME 2
Manipulate polynomial and rational functions

SPECIFIC OUTCOME 3
Decompose rational functions into partial fractions

SPECIFIC OUTCOME 4
Solve quadratic inequalities

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Use and apply matrices *to* represent data and position *three-dimensionally*

SAQA US ID	*UNIT STANDARD TITLE*		
243836	Use and apply matrices to represent data and position three-dimensionally		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2-4			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level4	2

SPECIFIC OUTCOME 1
Perform operations on **a** 3 x 3 matrix.

SPECIFIC OUTCOME 2
Use graphs, matrices and simple algorithms to solve travel problems.

SPECIFIC OUTCOME 3
Solve minimum connector and travelling salesman problems using techniques learned in this course.

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UNIT STANDARD:

Use explicit form and difference equations to model simple and compound growth and decay problems

SAQA US ID	*UNIT STANDARD TITLE*		
243837	Use explicit form and difference equations to model simple and compound growth and decay problems		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

SPECIFIC OUTCOME 1
Solve annuity problems involving changing circumstances such as changes to time periods, repayments, withdrawals or interest rates.

SPECIFIC OUTCOME 2
Solve population growth and decay problems using simple discrete population models,

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UNIT STANDARD:

Use and apply matrices

SAQA US ID	*UNIT STANDARD TITLE*		
243030	Use and apply matrices		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L *2* **-4**			
FIELD		*SUBFIELD*	
10 - Phvsical. Mathematical. Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	2

SPECIFIC OUTCOME 1
Arrange numbers in a suitable rectangular array (matrix) to facilitate problem solving

SPECIFIC OUTCOME 2
Perform operations on matrices.

SPECIFIC OUTCOME 3
Solve systems of two variable linear equations by the method of diagonalisation

SPECIFIC OUTCOME 4
Find the inverse of 2 x 2 matrices by a sequence of row transformation

SPECIFIC OUTCOME 5
Define simple, regular and connected graphs, their vertices, edges and the degree of a graph.

SPECIFIC OUTCOME 6
Define and apply walks, paths, circuits

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UNIT STANDARD:

Apply matrices to transformations

SAQA US ID	UNIT STANDARD TITLE		
243840	Apply matrices to transformations		
SGB		PROVIDER	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		SUBFIELD	
10 -Physical, Mathematical. Computer and Life Sciences		Mathematical Sciences	
ABET BAND	UNIT STANDARD N P E	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	2

SPECIFIC OUTCOME 1
Perform basic transformations on a point or shape in a Cartesian Plane.

SPECIFIC OUTCOME *2*
Use a matrix to transform a point or shape in the Cartesian Plane.

SPECIFIC OUTCOME 3
Characterise and classify fundamental properties of graphs

SPECIFIC OUTCOME 4
Apply graphs to simple problem solving situations

SPECIFIC OUTCOME 5
Determine the shortest path using the shortest path algorithm.

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UNIT STANDARD:

Find the derivatives of a range of functions and ***apply them to problems***

SAQA US ID	*UNIT STANDARD TITLE*		
243841	Find the derivatives of a range of functions and apply them to problems		
SGB		*PROVIDER*	
SGB for Math Literacy, Math, Math Sciences L 2 -4			
FIELD		*SUBFIELD*	
10 -Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	*UNIT STANDARD* TYPE	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	6

SPECIFIC OUTCOME 1
Represent mathematical functions graphically to enable analysis of the function.

SPECIFIC OUTCOME 2
Use the three reciprocal functions: secθ, cosecθ and cote in trigonometric problems.

SPECIFIC OUTCOME 3
Use radian measure in working with trigonometric functions.

SPECIFIC OUTCOME 4
Analyse limits and the continuity of algebraic functions using graphical representations and definitions.