Mathematics 3205
June 2011 Public Exam Outcome Report

This examination follows the specifications, conventions and standards set out in the:
Mathematics Public Examination Standards

Units 1 – Quadratics
2 – Rate of Change
3 – Exponential Growth
4 – Circle Geometry

PART I: Selected Response—Total Value: 50%

Item	Curriculum Guide Pages	Outcome	Cognitive Level	Outcome Description
1	(Unit 1) 44-67	C4	L2	Determine the function rule for an arithmetic sequence.
2	44-67	C8	L1	Match a mapping rule to a quadratic function.
3	44-67	C4	L1	Determine the third level difference of a cubic function.
4	44-67	A7,C8	L1	Find the range of a quadratic function.
5	44-67	C8,31,32	L1	Given a quadratic function in transformational form, identify the transformations as compared to $y = x^2$.
6	44-67	C29,31	L1	Determine the value of D_2 from data plotted on a graph.
7	44-67	C31,32	L2	Given a quadratic function with an unknown coefficient and the axis of symmetry of the function, find the unknown coefficient.
8	44-67	A9,B10,C22	L1	Find the exact roots of a quadratic equation.
9	44-67	C3,8,32	L2	Identify the graph represented by a quadratic function.
10	44-67	C8	L2	Identify a quadratic function given the vertex and an intercept.
11	44-67	C9	L2	Convert a quadratic function from transformational form to general form.
12	44-67	A4,9,B1,10,11,C22	L2	Determine a quadratic equation given two complex roots.
13	44-67	A4	L1	Identify the sum and product of the roots of a quadratic equation which includes variable coefficients.
14	44-67	A4,C15	L1	Given the zeros of a function, identify a possible value of the discriminant.
15	44-67	A4,B1	L2	Given a quadratic equation with an unknown coefficient and the discriminant of the equation, find the unknown coefficient.

16	44-67	B1,C9,31	L2	Given a quadratic function representing the path of an object, find the time it takes the object to reach its maximum height.
17	44-67	A4,C22,23	L3	Given the nature of the roots of a quadratic equation, determine the value of an unknown coefficient.
18	Unit 2 70-81	C16,18	L1	Describe the rate of change represented in a graph.
19	70-81	C30	L2	Determine a function that represents the volume of an object at a given instant.
20	(Unit 3) 84-113	B2,C4,29,F1	L2	Identify a geometric relationship from a set of plotted coordinates.
21	84-113	C4,11	L1	Identify an exponential function represented by a given table of values.
22	84-113	C33	L1	Given an exponential function, identify growth/decay curves.
23	84-113	C33,34	L2	Given the graphs of the exponential functions, compare the *y*-intercepts and the bases of exponential functions.
24	84-113	A7	L1	Determine the range of an exponential function.
25	84-113	C11,34,35	L1	Identify the mapping rule of an exponential function transformed from the base function.
26	84-113	B12,C24	L2	Solve an exponential equation involving unlike bases.
27	84-113	C34	L1	Determine the initial value of an exponential function which models real-world phenomena.
28	84-113	B12	L1	Identify an equivalent form of an exponential expression.
29	84-113	B12	L2	Using the laws of exponents, simplify a rational expression.
30	84-113	B13,C24	L2	Identify equivalent logarithmic expressions using the laws of logarithms.
31	84-113	C34	L2	Determine the focal point of an exponential function.
32	84-113	A7	L1	Find the domain of a logarithmic function.
33	84-113	C11,19	L1	Identify inverse functions in logarithmic form and exponential form.
34	84-113	A5,C24	L2	Solve an exponential equation that can be written with like bases.
35	84-113	B1,12,13,C24	L2	Solve a logarithmic equation using the laws of logarithms.
36	84-113	B1,13,C24	L2	Solve a logarithmic equation using the laws of logarithms.
37	(Unit 4) 116-141	E7	L2	Using chord properties, determine the length of a chord of a circle.
38	116-141	E12	L1	Identify the converse of a statement.
39	116-141	E4	L2	Using chord properties, determine the equation of a line containing a line segment within a circle.

40	116-141	E13	L1	Match a mapping rule to a transformed graph of $x^2 + y^2 = 1$.
41	116-141	E16	L1	Given a description of the transformations of the unit circle, $x^2 + y^2 = 1$, identify the equation of a transformed circle.
42	116-141	E4,7	L2	Determine a missing coordinate using the properties of the slopes of parallel lines.
43	116-141	E4,8	L2	Determine the measure of an angle using circle properties.
44	116-141	E4,8	L2	Determine the measure of an angle using circle properties.
45	116-141	A3,E3,14	L2	Determine the length of the major axis of an ellipse given the equation.
46	116-141	E15	L2	Given the equation of an ellipse with an unknown coefficient and one point on the ellipse, find the unknown coefficient.
47	116-141	E4,8	L2	Using tangent and chord properties, determine the measure of an angle inside a circle.
48	116-141	C36	L2	Find the exact value of a trigonometric expression.
49	116-141	E3,15	L3	Determine the equation of an ellipse given the four endpoints of its axes.
50	116-141	E15	L2	Determine the length of an arc of a circle given the central angle and radius of the circle.

PART II: Constructed Response—Total Value: 50%

Item	Curriculum Guide Page	Outcome	Cognitive Level	Value	Outcome Description
51	(Unit 1) 44-67	A3,9,B1,10,C22,23	L2	4	Algebraically determine the exact roots of a quadratic equation set up as a rational equation.
52	44-67	C1,31,32,F1	L3	4	Given three points and the maximum point of a parabolic path modeled by real-world phenomena, determine the quadratic function representing the path and use it to determine a coordinate on the parabola's path.
53	44-67	B1,C1,22,23	L3	4	Create a quadratic function which models item/cost revenue and use it to determine the cost per item that will maximize the revenue. Determine the maximum revenue.
54	44-67	A4,B10,C1,22,23,31	L2	4	Given a change in a rectangular area, create a quadratic equation that models the situation and use the equation to algebraically determine the change in dimensions of the area.

55	(Unit 2) 70-81	C17,28	L3	4	Algebraically determine an approximation for the instantaneous rate of change in the position of an object with respect to time for a given instant.
56	(Unit 3) 84-113	A5,7,B13,C24	L2	4	Solve a logarithmic equation using the laws of logarithms and the laws of exponents.
57	84-113	B1,13,C22,24	L2	4	Solve a quadratic equation which has a logarithmic expression as the variable of the quadratic.
58	84-113	C2,25	L3	4	Create two exponential functions modeling real world phenomena and compare the values at a given time.
59	84-113	A5,C2,11,F1	L3	4	Create an exponential function that models real world data from a table of values representing a cooling curve and use it to determine a value at a given time.
60	(Unit 4) 116-141	D1	L2	3	Using coordinate geometry, prove properties of a geometric shape given coordinates with variables.
61	116-141	D1,E4,13,14	L2	3	Find the equation of a circle, in standard form, given the coordinates of the center and a point on the circumference.
62	116-141	E14,15	L3	4	Convert the equation of an ellipse modeling real world phenomena from general form to transformational form, and state the lengths of the major and minor axis.
63	116-141	E4,5,8,9	L3	4	Determine the area of the shaded region of a diagram.