

Mathematics 3205

June 2010 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	C4,C8	L1	Find the second level difference given a quadratic sequence.
3	44 – 67	C4,C29	L2	Identify a quadratic relationship given a table of values.
4	44 – 67	A7,C8	L1	Find the range of a quadratic function.
5	44 – 67	C31	L1	Find the maximum value of a quadratic function.
6	44 – 67	C3,C8	L1	Match a mapping rule to a transformed graph of $y = x^2$.
7	44 – 67	C3, C32	L1	Identify a quadratic function given the vertex and a transformation.
8	44 – 67	C31,C32	L2	Find the vertical stretch factor of a quadratic function given its graph.
9	44 – 67	C8,C31,C32	L2	Identify transformations given 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	C22	L1	Identify the roots of a quadratic equation.
13	44 – 67	A4	L1	Identify the sum and product of the roots of a quadratic equation.
14	44 – 67	A4,C15	L1	Identify a possible value of the discriminant given the zeros of a function.
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	A9,B1,C22	L2	Find the zeros of a quadratic function.
17	44 – 67	C23	L3	Solve a quadratic equation modeled by real-world phenomena.

18	(Unit 2) 70 – 81	C16,C17,C30	L1	Given a graph, compare average rates of change between intervals.
19	70 – 81	C30	L2	Determine a function that represents the volume of an object at a given instant.
20	(Unit 3) 84 – 113	C4,C29,F1,B2	L2	Identify a geometric relationship from a set of plotted coordinates.
21	84 – 113	C11,C4	L1	Identify an exponential function represented by a given table of values.
22	84 – 113	C33	L1	Identify growth and decay curves from exponential functions.
23	84 – 113	C33,C34	L2	Compare the y -intercepts and the bases of exponential functions given the graphs of the exponential functions.
24	84 – 113	C34,B12,C24	L1	Find the y -intercept of an exponential function.
25	84 – 113	C11,C34,C35	L1	Identify the mapping rule of an exponential function transformed from the base function.
26	84 – 113	C34	L2	Determine the focal point of an exponential function.
27	84 – 113	B12,A5	L2	Find the value of an expression using the laws of exponents.
28	84 – 113	A5,B12	L2	Simplify an expression using the laws of exponents.
29	84 – 113	B12	L2	Simplify a rational expression using the laws of exponents.
30	84 – 113	B13	L1	Identify equivalent logarithmic expressions using the laws of logarithms.
31	84 – 113	A7	L1	Find the domain of a logarithmic function.
32	84 – 113	C11,C33	L1	Identify the logarithmic function represented by a given graph.
33	84 – 113	C19,C11	L1	Identify inverse functions in logarithmic form and exponential form.
34	84 – 113	C24,B1	L2	Solve an exponential equation involving unlike bases.
35	84 – 113	B13,C24,B12,B1	L2	Solve a logarithmic equation using the laws of logarithms.
36	84 – 113	B13,C24,B1	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 line segment within 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,E16	L1	Given the equation of a circle, identify the transformations from the unit circle, $x^2 + y^2 = 1$.

41	116 – 141	E4,E8,E9	L2	Determine the measure of an angle using tangent properties and circle properties.
42	116 – 141	E9	L2	Using tangent properties, find the length of a line segment.
43	116 – 141	D1,E4	L2	Using circle properties, find the length of a chord.
44	116 – 141	E3,E14	L2	Given the equation of a circle in general form, determine the radius.
45	116 – 141	A3,E3,E14	L2	Determine the length of the major axis of an ellipse given the equation of the ellipse.
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	E3,E13	L1	Match a mapping rule to a transformed graph of $x^2 + y^2 = 1$.
48	116 – 141	C36	L2	Given the coordinates of a point on the terminal arm of an angle on a unit circle, find the value of the angle.
49	116 – 141	A3,C36	L2	Find the exact value of a trigonometric expression.
50	116 – 141	E15	L3	Determine the length of an arc of a circle.

PART II: Constructed Response—Total Value: 50%

Item	Curriculum Guide Page	Outcome	Cognitive Level	Value	Outcome Description
51	(Unit 1) 44 – 67	B1,C22,B10,A9	L2	4	Algebraically determine the exact roots of a quadratic equation set up as a rational equation.
52	44 – 67	C8,C31	L2	4	Given the two x -intercepts and the maximum value of a parabola, determine the quadratic function for the parabola and it to determine a coordinate on the parabola.
53	44 – 67	C1,B1,C22,C23	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. Use this information to compare revenue amounts.
54	44 – 67	C1,B1,C22,C23	L3	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	C16,C17,C30,C28, C18,C27	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,B1,C24	L2	4	Solve an exponential equation using the laws of exponents. Solve a system of equations.
57	84 – 113	B13,C24	L2	4	Solve a logarithmic equation using the laws of logarithms.
58	84 – 113	C2,C25	L3	4	Create an exponential function that models a cooling curve given a table of values. Use the function to determine a value after a given amount of time.
59	84 – 113	B13,C2,24,25	L3	4	Create an exponential function modeled by real-world phenomena and use the function to determine the amount of time required to reach a given value.
60	(Unit 4) 116 – 141	E3,E14	L2	3	Convert the equation of an ellipse from general form to transformational form.
61	116 – 141	E4,B1	L2	3	Use the properties of circles to determine the length of a chord given the area of a sector of the circle.
62	116 – 141	D1,E5,A3	L3	4	Prove properties of geometric shapes using coordinate geometry.
63	116 – 141	E15,A3	L3	4	Determine the area of a segment of a circle.