Mathematics 3200
June 2016 Public Exam Outcome Report

This examination follows the specifications, conventions and standards set out in the:

Mathematics Public Examination Standards

Chapters:

1 Polynomial Functions
2 Function Transformations
3 Radical Functions
4 Trigonometry and the Unit Circle
5 Trigonometric Functions and Graphs
6 Trigonometric Identities
7 Exponential Functions
8 Logarithmic Functions
9 Permutations, Combinations and the Binomial Theorem

PART I: Selected Response—Total Value: 50%

Item	Curriculum Guide Pages	Outcome	Cognitive Level	Outcome Description
1	22	RF11	L2M	Identify a polynomial function.
2	22,24	RF11	L2M	Given the graph of a polynomial, identify its characteristics.
3	28	RF11	L2M	Find the zeros of a polynomial function.
4	24,34	RF11	L2A	Identify the graph of a polynomial function.
5	28	RF10	L2A	Identify a polynomial expression given a remainder and a linear divisor.
6	36	RF11	L2A	Identify the polynomial equation that models a prism with given dimensions.
7	56	RF3	L2M	Identify the mapping rule of an equation written in the form $\frac{1}{a}(y-k)=f\left[b(x-h)\right]$.
8	62	RF5	L2M	Identify graphs which are inverses of one another.
9	58	RF3	L2A	Identify the equation of a transformed graph.
10	60	RF5	L2A	Identify the domain and range of a graph's inverse.
11	58	RF3	L2A	Given the domain of a function, identify the domain of a transformation of the function.
12	66	RF5	L2A	Given a function in the form $y=a(x-h)^2+k$, identify the inverse.
13	76	RF12	L2M	Given the graph of $y=f(x)$, identify the graph of $y=\sqrt{f(x)}$.

14	76	RF12	L2A	Given $y = f(x)$, identify the invariant points of $y = f(x)$ and $y = \sqrt{f(x)}$.
15	76	RF12	L2A	Given $f(x)$, identify the domain of $y = \sqrt{f(x)}$.
16	94	T3	L2M	Identify the quadrant an angle is located knowing the signs of two trigonometric ratios.
17	90	T2	L2M	Identify the equation of a circle with a given radius (expressed as variables) centered at the origin.
18	86	T1	L2A	Given the graph of an angle in radians, identify the measure of the angle in degrees.
19	94	T3	L2A	Solve a trigonometric equation given the domain.
20	92	T3	L2A	Find the exact value of a trigonometric expression.
21	94	T3	L2A	Determine the exact value of a trigonometric ratio given a point on terminal arm of an angle in standard position.
22	108	T4	L2M	Determine the period of a sinusoidal function given its equation.
23	109-110	T4	L2M	Determine the amplitude of a sinusoidal function given its graph.
24	108,110	T4	L2A	Identify the equation of a trigonometric function given its graph.
25	108	T4	L2A	Determine the range of a sinusoidal function.
26	114,115	T5	L2A	Using a graph, identify the general solution for an equation involving a trigonometric expression.
27	122	T6	L2M	Determine the non-permissible values of a trigonometric expression.
28	126	T6	L2M	Using the sum, difference, or double angle formulae, determine an equivalent trigonometric expression.
29	130,132	T6	L2M	Identify a trigonometric equation that is true.
30	126	T6	L2A	Simplify a trigonometric expression using trigonometric identities.
31	128	T6	L2A	Find the exact value of a trigonometric expression using sum or difference identities.
32	130	T6,T3	L2A	Given a trigonometric ratio within a defined quadrant, determine, using a double angle formulae, the exact value of a trigonometric expression.
33	136	T5	L3	Identify the error in a solution of a trigonometric equation.
34	152,154	RF9	L2M	Given a population growth scenario, determine the function that models the situation.
35	146	RF8	L2M	Identify the horizontal asymptote of an exponential function.
36	146	RF8	L2A	Identify the horizontal translation of an exponential function that has been transformed.

37	148	RF9	L2A	Determine the solution of an exponential equation for which both sides of the equation can be written as rational powers of the same base.
38	146	RF8	L2A	Given the characteristics of an exponential function, identify its graph.
39	160	RF7	L2M	Determine the exponential form of a logarithmic equation that involves rational exponents, all of which are variables.
40	168	RF7	L2M	Simplify a logarithmic expression involving variables.
41	170	RF7	L2A	Use the laws of logarithms to evaluate an expression
42	170	RF7	L2A	Simplify a logarithmic expression.
43	170	RF7	L2A	Determine the solution of an exponential equation in which the bases are not rational powers of one another.
44	186	PCBT1	L2M	Solve a counting problem.
45	188	PCBT2	L2M	Given an expression involving factorials, identify a simplified equivalent expression.
46	200	PCBT3	L2M	Identify the expression that represents the number of ways a particular committee can be formed.
47	194	PCBT2	L2A	Solve a counting problem which involves repetition.
48	196	PCBT2	L2A	Solve a problem involving permutations with constraints.
49	204	PCBT4	L2A	Determine a specific term in a binomial expansion.
50	190	PCBT2	L3	Determine the number of paths from A to B in a diagram.

PART II: Constructed Response—Total Value: 50%

Item	Curriculum Guide Page	Outcome	Cognitive Level	Value	Outcome Description
51a	34	RF11	L2A	4	Given a polynomial function, **algebraically** determine all intercepts and sketch its graph.
51b	30-36	RF11	L3	2	Identify errors in a graph that is intended to represent a given polynomial function.
52a	56	RF3	L2A	3	Given the graph of $y = f(x)$ and a set of transformations, graph and determine the equation of the transformed function.
52b	58	RF3	L3	2	Given the graph of $y = f(x)$, graph its inverse $\left(y = f^{-1}(x)\right)$ and identify the invariant points of the graphs.

53a	76,78	RF12	L2A	2	Graph a radical function and state its domain and range.
53b	76	RF12	L3	2	Graph $y = f(x)$ and $y = \sqrt{f(x)}$, where variables are used to describe the characteristics of $y = f(x)$. Label the *x* and y intercepts of both.
54	92	T3	L2A	4	Algebraically determine the exact value, in simplest form, of a trigonometric expression.
55a	98,114	T5	L2A	3	Algebraically determine all solutions to a trigonometric equation
55b	110	T4	L3	3	Determine the equation of a sinusoidal function modelled by a word problem and use it to determine a value at a point in time.
56a	98,114,134, 136	T5	L2A	4	Algebraically determine the solutions to a trigonometric equation with restrictions.
56b	128,132	T6	L3	3	Prove, algebraically, that a trigonometric identity is valid.
57	148	RF9	L2A	3	Algebraically determine the solution of an exponential equation for which both sides can be written as rational powers of the same base.
58a	172	RF9	L2A	2	Solve a logarithmic equation using the laws of logarithms.
58b	176	RF9	L2A	3	Solve a problem that involves the application of exponential equations to a loan.
58c	162	RF8	L3	2	Given a point on a logarithmic function determine its base and determine a coordinate of a point on the inverse of the graph.
58d	174	RF9	L3	2	Use the laws of logarithms to solve for a given variable in a logarithmic equation,
59a	192	PCBT2	L2A	2	Given the value of k, $k \in N$, solve ${}_nC_r = k$.
59b	192,196	PCBT2	L3	2	Solve a permutation word problem.
59c	204	PCBT4	L2A	2	Determine two specified terms of a binomial expansion.