

SCHOOL REPORT

JUNE 2011

Case Study #8

Table 1
Pure Mathematics 30
Percentage of Students Who Achieved Standards on Their Final Course Mark

Standard	Final Course Mark Representing Standard (%)	Percentage of Students Who Achieved Standard
Standard		Prov. School
Acceptable Standard	50	90.2
Standard of Excellence	80	29.4
Number of Students Included in Report		10573
		65

Table 2
Pure Mathematics 30
Percentage Distribution of A, B, C, and F, Averages, and Standard Deviations of Scores

Scores	School-Awarded Mark	Diploma Examination Mark	Final Course Mark
	Prov. School	Prov. School	Prov. School
A (80 - 100%)	37.6	28.1	29.4
B (65 - 79%)	32.4	25.4	31.1
C (50 - 64%)	23.5	23.9	29.6
F (0 - 49%)	6.5	22.6	9.8
Average Percent Score	72.2	65.5	69.2
Standard Deviation	15.1	18.9	15.9

$$Z = \frac{(61.4 - 72.2)}{15.1}$$

$$Z = \frac{(58.9 - 65.5)}{18.9}$$

$$Z = \frac{(60.5 - 69.2)}{15.9}$$

Please refer to "Guidelines for Interpreting the Diploma Examination Detailed Reports" for suggestions about how to use this report.

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Table 3
Pure Mathematics 30
Percentage of Students Who Achieved Standards on Their Final Course Mark, by Gender

Gender	Students		Students Who Achieved the Acceptable Standard		Students Who Achieved the Standard of Excellence	
	Number	Percent of Total	Number	Percent of Gender	Number	Percent of Gender
Province						
	Male	5254	49.7	4765	90.7	1641
Female	5319	50.3	4771	89.7	1472	27.7
School						
Male	30	46.2	25	83.3	6	20.0
Female	35	53.8	20	57.1	6	17.1

Table 4
Pure Mathematics 30
Averages, and Standard Deviations of Scores, by Gender

Scores	School-Awarded Mark		Diploma Examination Mark		Final Course Mark			
	Province Male	Province Female	School Male	School Female	Province Male	Province Female	School Male	School Female
A (80 - 100%)	38.0	37.2	26.7	17.1	30.7	25.6	16.7	17.1
B (65 - 79%)	32.1	32.7	30.0	20.0	25.4	25.3	43.3	8.6
C (50 - 64%)	22.9	24.2	30.0	34.3	23.2	24.6	23.3	31.4
F (0 - 49%)	7.1	6.0	13.3	28.6	20.7	24.4	16.7	42.9
Average Percent	72.3	72.1	66.4	57.1	66.8	64.2	64.1	54.5
Standard Deviation	15.4	14.8	16.6	19.1	18.9	18.9	18.3	20.4

$$z = -0.38 \quad z = -1.01$$

$$z = -0.14 \quad z = -0.51$$

$$z = -0.28 \quad z = -0.74$$

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Table 5
Pure Mathematics 30
Average Raw Scores and Standard Deviations, by Item Format

Item Format	Total Marks Possible	Average Raw Score	Standard Deviation
		Prov. School	Prov. School
Multiple Choice	33	21.7	6.3
		19.5	6.7
Numerical Response	7	3.4	2.0
		2.9	1.9

$$Z = \frac{19.5 - 21.7}{6.3}$$

$$= -0.31$$

$$Z = -0.25$$

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Table 6
Pure Mathematics 30
Raw Score Results, by Reporting Category

Mathematical Unit	Total Marks		Average Raw Score		Standard Deviation	
	Possible	Prov.	School	Prov.	School	
Transformations of Functions	6	3.9	4.0	1.5	1.7	
Exponents, Logarithms, and Geometric Series	8	5.5	5.0	1.9	1.9	
Trigonometry	10	6.4	5.7	2.4	2.6	
Conic Sections	5	3.2	3.1	1.4	1.4	
Permutations and Combinations	7	3.8	2.9	1.7	1.6	
Statistics	4	2.3	1.8	1.3	1.4	
Cognitive Level						
Procedural	14	8.5	7.4	3.2	3.1	
Conceptual	13	8.9	8.3	2.7	3.0	
Problem Solving	13	7.8	6.8	3.0	3.0	

$z = -0.07$

$z = -0.53$

$z = -0.38$

$$z = \frac{4.0 - 3.9}{1.5} = +0.07$$

$$z = -0.26$$

$$z = -0.29$$

$$z = -0.07$$

$$z = -0.53$$

$$z = -0.38$$

$$z = -0.22$$

$$z = \frac{7.4 - 8.5}{3.2} = -0.34$$

$$z = -0.33$$

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Table 7 - 1
Pure Mathematics 30
Results, Blueprint Classifications, and Item Descriptions, by Item

Item #	% Correct Prov. Sch.	Mathematical Unit	Cognitive Level	Item Description
1	65.9 64.6	TF	C	Determine the transformation, given the transformed equation and the equation of the original function. (Outcome 1.2)
2	81.1 83.1	TF	C	Determine a possible transformation equation, given a point on the original function and the corresponding point on the transformed function. (Outcome 1.1)
3	41.1 46.2	TF	C	Determine the range of a transformed function, given the graph of the original function and the transformation equation. (Outcome 1.4)
4	72.6 60.0	TF	C	Determine the transformation equation for a given function subject to given conditions. (Outcome 1.5)
5	85.7 84.6	TF	C	Identify a possible transformation equation, given the graph of the original function and the graph of the transformed function. (Outcome 1.3)
NR1	48.2 60.0	TF	P	Determine the coordinates of a point on a transformed function, given the point on the original function and the transformation equation. (Outcome 1.5)
6	46.7 36.9	ELGS	PS	Determine the sum of a geometric series, given the initial term, the rate of increase and the number of terms. (Outcome 2.1)
NR2	63.0 44.6	ELGS	C	Order the common ratios of four geometric sequences which are shown in graphical form. (Outcome 2.2)
7	78.9 75.4	ELGS	PS	Determine the solution of an exponential equation with two variables. (Outcome 2.3)
8	76.4 70.8	ELGS	P	Determine the solution of a logarithmic equation. (Outcome 2.4) Standard of Excellence

Mathematical Unit

TF - Transformations of Functions
ELGS - Exponents, Logarithms, and Geometric Series
TRIG - Trigonometry
CS - Conic Sections
PC - Permutations and Combinations
STAT - Statistics

Cognitive Level

P - Procedural
C - Conceptual
PS - Problem Solving

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Table 7 - 2
Pure Mathematics 30
Results, Blueprint Classifications, and Item Descriptions, by Item

Item #	% Correct Prov. Sch.	Mathematical Unit	Cognitive Level	Item Description
9	81.2 80.0	ELGS	PS	Determine the value of a logarithmic expression to base 10, given two logarithmic equations with different bases. (Outcomes 2.4, 2.7)
10	59.3 53.8	ELGS	C	Determine an exponential equation, given the initial population and the rate of increase. (Outcome 2.6)
11	75.3 76.9	ELGS	PS	Determine a factor in a logarithmic equation, given the logarithmic equation and two values of one parameter. (Outcome 2.8) Standard of Excellence
12	71.0 66.2	ELGS	C	Determine the x-intercept and the equation of the asymptote of a transformed function given the function, its graph, and a transformation equation. (Outcomes 2.5, 1.1)
13	75.2 66.2	TRIG	PS	Determine the arc length, given the radius and angle of sweep. (Outcome 3.1)
14	74.3 63.1	TRIG	P	Determine a trigonometric expression equivalent to a given trigonometric expression. (Outcomes 3.2, 3.7)
15	72.8 72.3	TRIG	C	Determine the value of a parameter in a trigonometric equation subject to a condition. (Outcome 3.3)
16	52.7 41.5	TRIG	P	Determine the general solution of a first-degree trigonometric equation. (Outcome 3.4) Standard of Excellence
17	67.1 67.7	TRIG	PS	Determine an equivalent expression to a given second-degree trigonometric expression with a restriction. (Outcome 3.5)
18	58.8 49.2	TRIG	P	Determine the exact value of a trigonometric ratio in a given domain, given the value of another trigonometric ratio of the same angle. (Outcome 3.6)

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Table 7 - 3
Pure Mathematics 30
Results, Blueprint Classifications, and Item Descriptions, by Item

Item #	% Correct Prov. Sch.	Mathematical Unit	Cognitive Level	Item Description
NR3	47.7 40.0	TRIG	PS	Determine the value of a parameter in a second-degree trigonometric identity, subject to restrictions. (Outcomes 3.5,3.7)
19	67.5 63.1	TRIG	P	Determine an equation of a transformed trigonometric function, given two conditions. (Outcome 3.8)
20	84.7 76.9	TRIG	C	Identify a point of intersection of the graphs of two trigonometric functions. (Outcome 3.9)
NR4	40.9 27.7	TRIG	PS	Determine a value of one variable in a transformed trigonometric function, given a value of the other variable. (Outcome 3.10)
NR5	59.5 64.6	CS	C	Determine the conic sections produced when a double-napped cone with a given vertex angle is sliced by a plane at given angles to the axis. (Outcome 4.1)
21	66.2 67.7	CS	C	Identify the property that changes when a conic section, whose equation is given in standard form, undergoes two transformations. (Outcome 4.2)
22	60.0 60.0	CS	P	Determine a parameter in a standard form equation of a conic section, whose partial graph is given along with a vertex and two other points. (Outcome 4.2)
23	57.7 46.2	CS	PS	Determine the radius of the circle whose equation is given in general form. (Outcome 4.3) Standard of Excellence
24	71.7 69.2	CS	P	Determine the general form equation of a conic section whose equation is given in standard form. (Outcome 4.3)
25	74.7 61.5	PC	PS	Determine the number of distinct designs of an object subject to restrictions. (Outcome 5.1) Standard of Excellence

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Table 7 - 4
Pure Mathematics 30
Results, Blueprint Classifications, and Item Descriptions, by Item

Item #	% Correct Prov. Sch.	Mathematical Unit	Cognitive Level	Item Description
26	55.0 29.2	PC	P	Determine the number of ways that prizes can be awarded to two groups, subject to restrictions. (Outcomes 5.2, 5.3)
27	54.9 47.7	PC	PS	Determine the number of ways that selections can be made from a group with restrictions. (Outcome 5.3) Standard of Excellence
28	54.5 41.5	PC	P	Determine the number of possible routes in a two-dimensional pathway problem subject to a restriction. (Outcome 5.5)
29	52.7 49.2	PC	P	Determine the values of two parameters in an expansion of a binomial expression. (Outcome 5.6)
30	65.4 44.6	PC	C	Determine the probability of an event subject to restrictions. (Outcome 5.7)
NR6	21.3 12.3	PC	PS	Determine the probability of a compound event subject to conditions. (Outcome 5.7) Standard of Excellence
31	55.8 38.5	STAT	PS	Determine the probability of an event occurring in a binomial experiment. (Outcome 6.2)
32	48.7 52.3	STAT	P	Determine the population standard deviation of a set of data. (Outcome 6.1)
33	67.0 44.6	STAT	P	Determine the standard deviation of a set of scores that are normally distributed, given the mean and data linked to the z-score. (Outcome 6.3)
NR7	58.6 44.6	STAT	P	Determine the probability of an event occurring in a set of data that are normally distributed given the mean, standard deviation and data linked to the z-score. (Outcome 6.3)

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