

**Principles of Mathematics Grade 10: Numerical Response
An Item-Level Analysis (Provincial Level)**

British Columbia

All schools

June/2007

Provincial Principles of Mathematics 10 Item-Level Response Reports include data for all BC students who wrote the exam in June 2007 (about 26,530 students). Both public and independent schools are included. The Principles of Mathematics 10 June 2007 provincial Item-Level Response Report displays the proportion of students who made errors on each exam item (Number, Patterns and Relations, Shape and Space, Statistics and Probability) that require a Numerical Response. For each exam item, the report provides a description of the specific curricular aspects that need attention.

Click [here](#) to view the Prescribed Learning Outcomes

Form	Item #	Domain	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention
A	7	Number	B5	3895	64	Students did not apply correctly the formula for the area of a triangle to determine its height and/or made mistakes with radicals, or did not use a calculator.
A	15	Number	B9	4482	64	Students did not know how to manipulate radicals and rational exponents and/or did not make the difference between base and exponent.
A	20	Patterns and Relations	C4	4437	38	Students did not know the properties of a geometric sequence and did not correctly find the common ratio and/or made mistakes in applying the formula for a general term.
A	30	Patterns and Relations	C19	4769	8	Students did not know how to write a cost formula with a fixed cost plus a variable term and/or could not solve a linear equation to find the number of participants.
A	33	Patterns	C6	4169	47	Students incorrectly expanded a binomial squared and

		and Relations				simplified an algebraic expression and/or made a mistake in solving a linear equation.
A	41	Patterns and Relations	C11	4488	38	Students likely made mistakes in solving an equation involving rational expressions that led to a linear equation for x.
A	49	Shape and space	D3	4384	46	Students made mistakes in solving 2 right angle triangles with common hypotenuses and/or using trigonometric ratios.
A	55	Shape and space	D6	4059	58	Students likely did not know how to calculate the distance between 2 points and/or to use the result to calculate the area of a square.
B	7	Number	B5	4045	39	Students made mistakes in manipulating radicals and exponents and/or evaluating the result to two decimal places, or did not use a calculator.
B	15	Number	B9	3941	72	Students did not know how to write a radical as a power with a rational exponent, use the laws of exponents and/or did not make the difference between base and exponent.
B	20	Patterns and Relations	C2	4139	58	Students did not recognize an arithmetic series and/or did not correctly apply the formula for the sum of the arithmetic series.
B	30	Patterns and Relations	C18	3931	49	Students did not know how to obtain the x-intercept of a graph described by the equation of a line in standard form and/or made a mistake in solving a linear equation.
B	33	Patterns and Relations	C6	3817	23	Students incorrectly expanded a binomial squared and/or made a mistake in solving a linear equation to obtain an unknown parameter.
B	41	Patterns and Relations	C9	3779	32	Students likely did not know how to obtain non-permissible values of a rational expression and/or made a mistake in solving a linear equation.
B	49	Shape and	D1	4095	29	Students incorrectly applied the formula for the volume of

		space				a sphere and/or made mistakes in obtaining the answer to two decimal places.
B	55	Shape and space	D8	3682	76	Students likely did not know how to write the slope of a line passing through two points and/or made mistakes in finding a parameter when the slope was given.
C	7	Number	B5	4102	38	Students made mistakes in manipulating radicals and/or evaluating the result to two decimal places, or did not use a calculator.
C	15	Number	B9	3696	60	Students did not know how to manipulate rational exponents and use the laws of exponents, and/or could not identify an exponent.
C	20	Patterns and Relations	C4	3948	60	Students did not know the properties of a geometric sequence and/or did not correctly find the common ratio.
C	30	Patterns and Relations	C18	3855	53	Students did not know how to obtain the x-intercept of a graph described by the equation of a line in standard form and/or made a mistake in solving a linear equation.
C	33	Patterns and Relations	C5	3822	34	Students incorrectly factored a trinomial and/or made a mistake identifying an unknown parameter.
C	41	Patterns and Relations	C7	3578	53	Students did not know how to divide a polynomial by a binomial and/or could not identify the remainder.
C	49	Shape and space	D4	3858	65	Students made a mistake in using the calculator to obtain an angle when knowing the sine ratio and/or did not know how to obtain the obtuse angle with a given sine ratio and/or did not answer to the nearest degree.
C	55	Shape and space	D1	4077	35	Students likely made a mistake in applying the formula for the volume of a sphere knowing its diameter and/or did not answer to two decimal places.
D	7	Number	B5	4557	25	Students made mistakes in manipulating radicals and/or

						evaluating the result to two decimal places, or did not use a calculator.
D	15	Number	B9	4311	56	Students did not know how to write a radical as a power with rational exponent and/or could not identify an exponent.
D	20	Patterns and Relations	C4	4718	28	Students did not know the properties of a geometric sequence and/or did not correctly find the common ratio and/or made a mistake in finding a term in the sequence.
D	30	Patterns and Relations	C16	4077	48	Students did not know how to associate a graph with a function and/or did not understand the function notation and/or could not identify the value of the function on the graph.
D	33	Patterns and Relations	C8	4163	47	Students incorrectly factored two trinomials and/or did not know how to reduce a rational expression.
D	41	Patterns and Relations	C7	4112	53	Students did not know how to divide a polynomial by a binomial and/or could not identify the remainder.
D	49	Shape and space	D1	4430	33	Students did not know how to find the radius of a sphere knowing its surface area and/or made a mistake in obtaining the diameter and/or were unfamiliar with the formula for the surface area of a sphere.
D	55	Shape and space	D8	4544	28	Students did not know how to obtain the slope of a line using its graph.
E	7	Number	B5	3189	67	Students did not apply correctly the formula for the area of a triangle to determine its height and/or made mistakes with radicals, or did not use a calculator.
E	15	Number	B9	3763	67	Students did not know how to manipulate radicals and rational exponents and/or did not make the difference between base and exponent.

E	20	Patterns and Relations	C19	3712	40	Students did not know how to obtain the y-intercept of a graph described by the equation of a line in standard form and/or made mistakes in determining the y-intercept.
E	30	Patterns and Relations	C2	3862	56	Students did not know how to find a partial sum of an arithmetic series or used an incorrect formula and/or substituted an incorrect value for one of the terms and/or made a mistake in finding the sum of the series.
E	33	Patterns and Relations	C6	3584	25	Students incorrectly expanded the cube of a binomial and/or incorrectly simplified terms to determine the coefficient of the required term and/or determined the coefficient of the wrong term.
E	41	Patterns and Relations	C9	3505	62	Students did not know how to obtain the number of non-permissible values of a rational expression and/or did not understand what was meant by “non-permissible” values.
E	49	Shape and space	D1	3658	37	Students did not know how to find the radius of a sphere knowing its surface area and/or made a mistake in obtaining the diameter and/or were unfamiliar with the formula for the surface area of a sphere.
E	55	Shape and space	D8	3782	29	Students did not know how to obtain the slope of a line using its graph.
F	7	Number	B5	3620	69	Students did not know how to determine the base of a triangle based on the endpoints of a segment line and/or did not know how to determine the area of a triangle and/or made mistakes in manipulating radicals when evaluating the area and/or did not obtain the answer to two decimal places and/or did not have a calculator.
F	15	Number	B5	4034	55	Students incorrectly evaluated an expression for a given value of x and/or did not know how to manipulate rational negative exponents to obtain the result to two decimal places and/or did not have a calculator.
F	20	Patterns	C2	4072	52	Students did not recognize an arithmetic series and/or did

		and Relations				not correctly apply the formula for the sum of the arithmetic series.
F	30	Patterns and Relations	C18	3866	45	Students did not know how to obtain the x-intercept of a graph described by the equation of a line in standard form and/or made a mistake in solving a linear equation.
F	33	Patterns and Relations	C5	3760	32	Students incorrectly factored a trinomial and/or made a mistake identifying an unknown parameter.
F	41	Patterns and Relations	C7	3581	49	Students did not know how to divide a polynomial by a binomial and/or could not identify the remainder.
F	49	Shape and space	D3	3815	63	Students made mistakes in applying the tangent ratio and then the sine ratio to obtain the hypotenuse of a right triangle that has a leg in common with another right triangle and/or they found the length of another missing side and/or did not obtain the answer to two decimal places and/or did not have a calculator.
F	55	Shape and space	D6	3872	42	Students likely made a mistake in applying the formula for the length of a segment line and/or did not obtain the answer to two decimal places and/or did not recall the required formula and/or did not have a calculator.