

**Principles of Mathematics Grade 10: Number
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 of this specific curriculum organizer: Number.

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

Form	Item #	Question type	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention [$>20\%$ selected incorrect response]
A	2	MC	B3	4844	19	N/A
A	3	MC	B3	4841	15	N/A
A	4	MC	B2	4841	13	N/A
A	5	MC	B2	4832	21	*
A	6	MC	B1	4843	12	N/A
A	8	MC	B5	4781	70	<ul style="list-style-type: none"> Students correctly obtained the base and height of an equilateral triangle knowing the perimeter, but incorrectly determined the area. Students did not know how to obtain the base and height of an equilateral triangle knowing the perimeter.
A	9	MC	B8	4840	24	*

A	10	MC	B8	4825	46	<ul style="list-style-type: none"> When expanding a binomial squared involving radicals, students incorrectly simplified the square roots with the exponent and added the terms.
A	11	MC	B8	4832	25	*
A	12	MC	B8	4791	44	<ul style="list-style-type: none"> Students were unable to rationalize the denominator of an expression involving radicals.
A	13	MC	B9	4826	41	<ul style="list-style-type: none"> Students confused a rational exponent with a negative exponent
A	14	MC	B9	4805	58	<ul style="list-style-type: none"> Students correctly multiplied two monomials involving exponents and radicals, but thought that a negative exponent requires to reciprocate it.
B	2	MC	B2	4271	9	N/A
B	3	MC	B2	4270	24	*
B	4	MC	B1	4262	47	<ul style="list-style-type: none"> In a problem involving population density, students indicated a country with the highest density population as the least crowded.
B	5	MC	B3	4274	29	*
B	6	MC	B3	4267	62	<ul style="list-style-type: none"> Students did not recognize that a difference between two integers is an integer. Students did not recognize that the quotient of two integers is not always an integer.
B	8	MC	B5	4226	44	*
B	9	MC	B8	4275	18	N/A

B	10	MC	B8	4237	57	<ul style="list-style-type: none"> When simplifying a mixed radical that contained a fraction, students did not apply the radical to the denominator.
B	11	MC	B8	4263	34	*
B	12	MC	B8	4214	62	<ul style="list-style-type: none"> Students correctly rationalized the denominator of an expression involving radicals, but simplified only one term of the numerator with the denominator.
B	13	MC	B9	4270	49	<ul style="list-style-type: none"> When simplifying an expression with a negative rational exponent, students correctly reciprocated a negative exponent but incorrectly reciprocated the rational exponent in the result. When simplifying an expression with a negative rational exponent, students correctly replaced the rational exponent with a radical, but incorrectly treated the negative exponent as a coefficient.
B	14	MC	B9	4259	54	<ul style="list-style-type: none"> Students correctly applied a negative exponent to all variables in a product but forgot to take the reciprocal of the coefficient.
C	3	MC	B1	4368	11	N/A
C	4	MC	B1	4367	17	N/A
C	5	MC	B2	4339	35	<ul style="list-style-type: none"> In a 3-year loan table, students likely subtracted all interest charged and annual payments from the opening balance.
C	6	MC	B3	4359	26	*
C	8	MC	B5	4338	50	<ul style="list-style-type: none"> In a problem involving areas of overlapped geometric figures, students correctly used

						formulas but gave the result for the unshaded rather than the shaded region.
C	9	MC	B8	4362	25	*
C	10	MC	B8	4362	39	*
C	11	MC	B8	4347	66	<ul style="list-style-type: none"> • Students correctly rationalized a denominator, but made a sign error in the final radical expression. • When rationalizing the denominator students multiplied with the denominator rather than the conjugate radical expression.
C	12	MC	B8	4323	64	<ul style="list-style-type: none"> • Students correctly obtained the expression of the area between two centered circles, but added incorrectly when simplifying the result when expanding a binomial squared involving radicals.
C	13	MC	B9	4361	25	*
C	14	MC	B9	4339	52	<ul style="list-style-type: none"> • Students obtained an incomplete form on the square of a rational expression involving monomials.
D	3	MC	B1	4828	17	N/A
D	4	MC	B2	4754	56	<ul style="list-style-type: none"> • In a 3-year loan table, students likely gave the opening balance in Year 3 rather than final annual payment.
D	5	MC	B3	4833	30	*
D	6	MC	B3	4818	52	<ul style="list-style-type: none"> • Students thought that a rational number was an integer.

						<ul style="list-style-type: none"> Students thought that an integer was a whole number.
D	8	MC	B5	4803	46	<ul style="list-style-type: none"> Students incorrectly determined that the ratio of areas of two circles was equal to the ratio of their radii.
D	9	MC	B8	4829	17	N/A
D	10	MC	B8	4827	29	*
D	11	MC	B8	4790	63	<ul style="list-style-type: none"> Students applied the Pythagorean theorem to obtain a leg of a right triangle, but made mistakes in simplifying radicals to calculate the area of the triangle. Students incorrectly applied the Pythagorean theorem to determine a leg of a right triangle.
D	12	MC	B9	4823	62	<ul style="list-style-type: none"> Students correctly applied a negative exponent to a product of monomials except to the numerical coefficient.
D	13	MC	B9	4807	36	*
D	14	MC	B9	4792	64	<ul style="list-style-type: none"> When writing the product of 2 radicals as a power with rational exponent, students incorrectly added the numerators and the denominators of the exponents. When writing the product of 2 radicals as a power with rational exponent, students multiplied instead of adding the exponents.
E	2	MC	B3	3997	19	N/A
E	3	MC	B3	3994	17	N/A

E	4	MC	B2	3997	12	N/A
E	5	MC	B2	3998	22	*
E	6	MC	B1	3995	13	N/A
E	8	MC	B5	3951	72	<ul style="list-style-type: none"> • Students correctly obtained the base and height of an equilateral triangle knowing the perimeter, but incorrectly determined the area. • Students did not know how to obtain the base and height of an equilateral triangle knowing the perimeter.
E	9	MC	B8	3996	24	*
E	10	MC	B8	3983	46	<ul style="list-style-type: none"> • When expanding a binomial squared involving radicals, students incorrectly simplified the square roots with the exponent and added the terms.
E	11	MC	B8	3991	24	*
E	12	MC	B8	3935	45	<ul style="list-style-type: none"> • Students were unable to rationalize the denominator of an expression involving radicals.
E	13	MC	B9	3989	43	<ul style="list-style-type: none"> • Students confused a rational exponent with a negative exponent
E	14	MC	B9	3974	60	<ul style="list-style-type: none"> • Students correctly multiplied two monomials involving exponents and radicals, but thought that a negative exponent requires to reciprocate it.
F	3	MC	B1	4179	19	N/A
F	4	MC	B2	4190	18	N/A
F	5	MC	B3	4197	25	*

F	6	MC	B3	4193	42	<ul style="list-style-type: none"> Students did not recognize that half of an integer is not always an integer.
F	8	MC	B8	4192	22	*
F	9	MC	B8	4189	18	N/A
F	10	MC	B8	4191	17	N/A
F	11	MC	B8	4143	55	<ul style="list-style-type: none"> Students correctly rationalized the denominator but incorrectly simplified only the first term of the numerator with the denominator.
F	12	MC	B9	4191	46	*
F	13	MC	B9	4185	34	*
F	14	MC	B9	4171	42	*

Notes:

- (1) A description of the misconception is given when more than 20% of students answered the item incorrectly (i.e. selected a distractor).
- (2) '**N/A**' indicates that fewer than 20% of students answered the item incorrectly. Therefore, no description is provided.
- (3) '*' indicates that more than 20% of students answered the item incorrectly, but no single distractor was selected by more than 20% of the students. Therefore, no description is provided.