

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

British Columbia

All schools

June/2006

Provincial Principles of Mathematics 10 Item-Level Response Reports include data for all BC students who wrote the exam in June 2006 (about 26,450 students). Both public and independent schools are included. The Principles of Mathematics 10 June 2006 provincial Item-Level Response Report displays the proportion of students who made errors on each exam item (MC, MT or TF) of this specific curriculum organizer - Number. A description of the misconception is given when more than 20% of students selected the incorrect response.

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	1	MC	B3	4584	49	<ul style="list-style-type: none"> Students did not realize that the negative square root of a perfect square is a rational number.
A	2	MC	B1	4543	45	<ul style="list-style-type: none"> Students correctly calculated discount and tax rates, and the amount of discount and tax, but subtracted the discount after applying the tax to the regular price.
A	3	MC	B2	4578	12	N/A
A	6	MC	B5	4553	54	<ul style="list-style-type: none"> Students made mistakes in using the perimeter of an isosceles triangle and circumference of a circle.

A	8	MC	B8	4570	56	<ul style="list-style-type: none"> Students added unlike radicals.
A	9	MT	B8	4557	25	*
A	10	MT	B8	4559	45	*
A	11	MT	B8	4563	71	<ul style="list-style-type: none"> Students were not able to multiply by the conjugate to simplify an irrational expression.
A	12	MC	B9	4537	42	<ul style="list-style-type: none"> Students correctly calculated the numerator. Students thought two cubed was six in the denominator.
A	13	MC	B9	4562	70	<ul style="list-style-type: none"> Students multiplied the exponents instead of adding.
A	14	MC	B9	4529	69	<ul style="list-style-type: none"> Students canceled the negative exponent with the negative coefficient. Students correctly took the cube root. Students did not reciprocate the base because of the negative exponent.
B	3	MC	B1	3797	18	N/A
B	4	MC	B2	3793	23	*
B	5	TF	B3	3819	43	<ul style="list-style-type: none"> Student incorrectly believed that odd integers can evenly be divided by two.
B	6	MC	B3	3822	60	<ul style="list-style-type: none"> Students misinterpreted the number line or did not understand the definition of whole numbers.
B	8	MC	B8	3813	30	*
B	9	MT	B8	3798	28	*

B	10	MT	B8	3790	30	*
B	11	MT	B8	3756	62	<ul style="list-style-type: none"> Students were not able to multiply by the conjugate to simplify an irrational expression.
B	12	MC	B9	3810	51	<ul style="list-style-type: none"> Students incorrectly understood the relationship between negative exponents and reciprocals. Students incorrectly understood the relationship between square roots and exponents.
B	13	MC	B9	3813	38	*
B	14	MC	B9	3788	45	<ul style="list-style-type: none"> When simplifying an expression with a rational exponent, students correctly used the rational exponent, but only reciprocated the numerator.
C	1	MC	B1	4550	38	<ul style="list-style-type: none"> Students were unable to select a table of values which represented an exponential function.
C	2	MC	B1	4545	26	*
C	3	MC	B2	4538	18	N/A
C	4	MC	B3	4544	62	<ul style="list-style-type: none"> Students were unable to identify which numbers (of a set of given numbers) were subsets of different number systems.
C	5	TF	B3	4556	28	<ul style="list-style-type: none"> Students did not understand the definition of a rational number.
C	6	MC	B9	4547	46	<ul style="list-style-type: none"> Students correctly used the exponent laws to simplify a radical expression, but thought that a negative exponent made the base negative instead of reciprocating.

C	8	MC	B9	4521	68	<ul style="list-style-type: none"> Students correctly used the exponent laws to simplify a rational expression, but did not consider that the exponent was negative. Students correctly used the exponent laws to simplify a rational expression, but did not realize that an even exponent will make a negative base positive.
C	9	MT	B8	4526	27	*
C	10	MT	B8	4530	54	<ul style="list-style-type: none"> Students incorrectly squared a binomial with radicals.
C	11	MT	B8	4502	60	<ul style="list-style-type: none"> When simplifying an irrational expression, students correctly multiplied by the conjugate but added the two terms in the denominator instead of subtracting.
C	14	MC	B5	4528	58	<ul style="list-style-type: none"> Students found the volume of the prism instead of surface area.
D	1	MC	B3	4725	52	<ul style="list-style-type: none"> Students did not understand that irrational numbers in a fraction can cancel to make it rational.
D	2	MC	B3	4725	54	<ul style="list-style-type: none"> Students did not understand that the cube root of a negative number is negative and there for not a whole number.
D	3	MC	B1	4724	13	N/A
D	4	MC	B2	4724	7	N/A
D	8	MC	B9	4728	24	*

D	9	MT	B9	4725	25	*
D	10	MT	B9	4719	52	<ul style="list-style-type: none"> Students correctly found the fourth root of the variable but did nothing to the coefficient and ignored the fractional exponent.
D	11	MT	B9	4694	65	<ul style="list-style-type: none"> Students correctly found the exponent of the variable but did not have the exponent act on the coefficient.
D	12	MC	B8	4730	40	<ul style="list-style-type: none"> Students correctly multiplied two radicals but did not express the expression in simplest form.
D	13	MC	B8	4701	39	*
D	14	MC	B8	4657	47	<ul style="list-style-type: none"> When finding the height of a triangle with radical dimensions as the base and the area, students did not double the area when dividing by the base or made errors in manipulating the radicals when simplifying.
E	1	MC	B3	4209	48	<ul style="list-style-type: none"> Students did not realize that the negative square root of a perfect square is a rational number.
E	2	MC	B1	4173	43	<ul style="list-style-type: none"> Students correctly calculated discount and tax rates, and the amount of discount and tax, but subtracted the discount after applying the tax to the regular price.
E	3	MC	B2	4197	12	N/A
E	6	MC	B5	4178	51	<ul style="list-style-type: none"> Students made mistakes in using the formulae for perimeter of an isosceles triangle and circumference of a circle.

E	8	MC	B8	4193	54	<ul style="list-style-type: none"> Students added unlike radicals.
E	9	MT	B8	4186	23	*
E	10	MT	B8	4194	41	*
E	11	MT	B8	4188	68	<ul style="list-style-type: none"> Students were not able to multiply by the conjugate to simplify an irrational expression.
E	12	MC	B9	4155	42	<ul style="list-style-type: none"> Students correctly calculated the numerator. Students thought two cubed was six in the denominator.
E	13	MC	B9	4186	70	<ul style="list-style-type: none"> Students multiplied the exponents instead of adding.
E	14	MC	B9	4170	63	<ul style="list-style-type: none"> Students correctly took the cube root. Students did not reciprocate the base because of the negative exponent.
F	4	MC	B1	4528	29	*
F	5	TF	B5	4541	41	<ul style="list-style-type: none"> Students were not able to evaluate an expression with radicals.
F	6	MC	B2	4535	26	*
F	8	MC	B3	4541	27	*
F	9	MT	B8	4529	14	N/A
F	10	MT	B8	4495	42	<ul style="list-style-type: none"> Students did not change the sign while multiplying by the conjugate to simplify an irrational expression.
F	11	MT	B8	4515	42	<ul style="list-style-type: none"> Students did not properly expand a sum of unlike radicals being squared but just squared each one

						individually.
F	12	MC	B8	4525	34	<ul style="list-style-type: none"> Students were unable to multiply binomial expressions including radicals and incorrectly multiplied the first two and the second two radicals.
F	13	MC	B9	4535	49	<ul style="list-style-type: none"> Students did not understand the relationship between the numerator and denominator of a fractional exponent when applied to a radical expression.
F	14	MC	B9	4477	59	<ul style="list-style-type: none"> Students were unable to correctly divide with integral exponents and just ignored the sign of the exponent.

Note: '*' indicates that there was no specific curricular aspect that needed attention; 'N/A' indicates that there were fewer than 20% of the students who incorrectly answered the item, hence, no curricular note is reported.