2(x +3)
2x + 6

BEYOND THE ALGORITHM

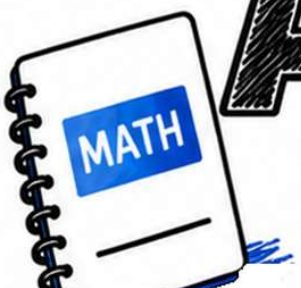


GRADE 7 MATH

UNIT 2

EXPRESSIONS & EQUATIONS

ERROR ANALYSIS



Name:



SECTION 1
Exponent Rules

Error Analysis 1

A student writes:

$$x^3 \cdot x^4 = x^{12}$$

What exponent rule did the student misuse?

Correct the expression and state the rule.

Error Analysis 2

A student writes:

$$(a^3)^4 = a^7$$

Identify and explain the error.

Correct the mathematics.

SECTION 1 Continued
Exponent Rules

Error Analysis 3

A student writes:

$$(5m)^0 = 0 \qquad (m \neq 0)$$

Explain what a zero exponent means.

Correct the value of the expression.

Error Analysis 4

A student writes:

$$(2x^3)^2 = 2x^6$$

Identify and explain the error.

Correct the mathematics.

Common Errors to Watch For

- multiplying exponents when multiplying like bases;
- adding exponents in a power-to-a-power expression;
- treating a zero exponent as zero;
- applying an outside exponent only to the variable;
- forgetting that every factor inside brackets is affected.

SECTION 2

Expressions & Order of Operations

Error Analysis 1

A student writes:

In $7 - 3x + 5$, the terms are 7, 3, x, and 5.

What is wrong with the student's list of terms?

List the terms correctly.

Error Analysis 2

A student writes:

For $-4y + 9$, the coefficient of y is 4.

Identify and explain the error.

Correct the mathematics.

Expressions & Order of Operations

Error Analysis 3

A student writes:

$$18 - 3 \times 4 = (18 - 3) \times 4 = 60$$

Which part of the order of operations was ignored?

Evaluate the expression correctly.

Error Analysis 4

A student writes:

$$|-8 + 3| = -5$$

Identify and explain the error.

Correct the mathematics.

Common Errors to Watch For

- splitting a product such as $3x$ into separate terms;
- dropping the sign from a coefficient;
- working strictly left to right instead of using order of operations;
- doing addition or subtraction before multiplication or division;
- forgetting that absolute value is never negative.

SECTION 3
Substitution & Evaluating Expressions

Error Analysis 1

A student writes:

For $3x^2$ when $x = -2$: $(3 \cdot -2)^2 = 36$.

What was incorrectly included inside the square?

Substitute and evaluate correctly.

Error Analysis 2

A student writes:

For $2a - 5$ when $a = -3$: $2(3) - 5 = 1$.

Identify and explain the error.

Correct the mathematics.

SECTION 3 Continued
Substitution & Evaluating Expressions

Error Analysis 3

A student writes:

$$\text{For } \frac{m}{n} + 4 \text{ when } m = -6, n = 3\text{: } \frac{-6}{3+4} = -\frac{6}{7}.$$

What did the student change about the original expression?

Substitute and evaluate correctly.

Error Analysis 4

A student writes:

$$\text{For } 2p - q^2 \text{ when } p = \tfrac{1}{2}, q = -3\text{: } 1 - (-9) = 10.$$

Identify and explain the error.

Correct the mathematics.

Common Errors to Watch For

- substituting without parentheses for negative values;
- losing a negative sign during substitution;
- changing the grouping shown by a fraction bar;
- squaring a negative number incorrectly;
- applying an exponent to a coefficient that is outside the power.

SECTION 4
The Distributive Property

Error Analysis 1

A student writes:

$$3(x + 4) = 3x + 4$$

Which term was not multiplied by 3?

Expand the expression correctly.

Error Analysis 2

A student writes:

$$-2(3x - 5) = -6x - 10$$

Identify and explain the error.

Correct the mathematics.