

Unit 6

Evaluating and Simplifying Variable Expressions

Math Essentials

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Consider...

Expressions	Equations
$4 - (-1)$	$4 = 1 + 3$
$5xy$	$5 + x = 1$
$\frac{8}{a} + 9$	$7ab = -10$

What's the difference??

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Evaluating algebraic expressions

- Algebraic expressions include a variable (a letter that can stand for various numbers) and constants

◦ Example: $\frac{y}{5}$ has the variable y and the constant 5

- If $y = 5$, $\frac{y}{5} = ?$
- If $y = 25$, $\frac{y}{5} = ?$

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Practice 6.1

1. Evaluate $x + 4$ for $x = 8$
2. Evaluate $a + 2b$ for $a = 1$ and $b = -3$
3. Evaluate $b - \frac{35}{a}$ when $a = 7$ and $b = 35$

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Practice 6.2

1. Evaluate the expression $-a + 2b$ when $a = 2$ and $b = -6$.
2. Evaluate $b^2 - 6b + 9$ when $b = 2$

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Practice 6.3

1. Evaluate $-4b - a$ when $a = \frac{2}{3}$ and $b = -\frac{2}{9}$
2. Evaluate $w - x + y$ when $w = 10$ and $x = -4.4$, and $y = -12.7$
3. Evaluate the expression $3d - c$ when $c = -8.5$ and $d = -1.2$

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Practice 6.4

Evaluate the following expressions.

1. $5x - x^2$ for $x = -2$
2. $4a - 5$ for $a = \frac{2}{3}$

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Consider...

- Suppose Bubba has 10 apples.
 - If he buys 4 more apples, how many does he have?
 - If he then eats 3 of those apples, how many does he have?
 - If he buys 2 oranges, how many does he have?
- $10a + 4a - 3a + 2b = 11a + 2b$
- He has 11 apples and 2 oranges.

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Combining like terms

- **Term:** a number or variable OR a product or quotient of numbers and variables.
 - Example: $3ab + 6a^4 - 7$ has 3 terms.
- **Like terms:** terms with the same variables.
 - Example: $4xy^2$ and $-xy^2$ are like terms

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Practice 6.5

Combine like terms.

1. $5x - 2x$
2. $7a + 6 + 2a - 5$

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Practice 6.6

Simplify

1. $10d - 3d$
2. $4(4y)$

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Practice 6.7

Subtract and simplify.

1. $\frac{1}{5x} - \frac{6}{7}$
2. $\frac{d}{6} - \frac{2}{7}$

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