

Evaluating Algebraic Expressions

Objective 1: Definitions of Constants, Variables, and Expressions

A **constant** is a fixed number.

$$2, 0.9, \frac{5}{7}, \pi$$

A **variable** is a letter or a symbol that represents an unknown number.

$$x, y, a, \theta$$

An **algebraic expression** is a combination of constants, variables, and grouping symbols formed by addition, subtraction, multiplication, division, and exponent rules.

$$x - 5, 2ab, \frac{1}{t+9}, 7m^2n^3, 3(s - 6)$$

Ex) Name whether each is a constant, variable or expression.

The letter z is a (an) _____.

$3x^2 + 4y$ is a (an) _____.

The number 6.5 is a (an) _____.

Objective 1 Extra Practice

Fill in the blank.

1. $5x^3 - 2x^2 + 9$ is _____.

2. t is _____.

3. 12 is _____.

Objective 2: Evaluating Algebraic Expressions of One Variable

How to Evaluate an Algebraic Expression of One Variable

1. Substitute the given number for the variable in an expression.
2. Find the value of the expression using the order of operations.

Ex) Evaluate each expression for the given variable.

(a) If $x = 3$, evaluate: $7x$

(b) If $x = -2$, evaluate: $2x^2$

Ex) Evaluate each expression for $x = 2$.

(a) $9x$

(b) $4x^3$

Ex) Evaluate each expression for $a = -3$.

(a) $2a - 1$

(b) $-a^2 + 4a + 20$

Objective 2 Extra Practice

Evaluate each expression with the given variable value.

1. $-9x + 5$ when $x = 11$.

2. $-5y^3$ when $y = -2$.

3. $-x^2 + 7x + 30$ when $x = -3$.

4. $\frac{44 - 5s}{3s}$ when $s = 4$.

Objective 3: Evaluating Algebraic Expressions of Two Variables

How to Evaluate an Algebraic Expression of Two Variables

1. Substitute the given numbers for the variables in an expression.
2. Find the value of the expression using the order of operations.

Ex) Evaluate each expression for $x = 5$ and $y = -1$.

(a) $3x + 6y$

(b) $4x^2 - 7y^2$

(c) $\frac{2x + y}{3y}$

Ex) Evaluate each expression for $x = -2$ and $y = 4$.

(a) $8x + 4y$

(b) $-5x^2 + 3y^2$

(c) $\frac{9x+5y}{x}$

Objective 3 Extra Practice

Factor each expression.

1. $-6x + 5y - 1$ when $x = -2$ and $y = -3$.

2. $4x^2 - y^3$ when $x = 5$ and $y = -1$.

3. $7x^2 + xy - 2y^2$ when $x = -3$ and $y = 6$.

4. $\frac{x^2 - 8y^2}{xy}$ when $x = 8$ and $y = -2$.