

# Algebraic Expressions

A group of terms that contains constants, variables, and operations

Examples:  $9w+12$        $7+3y+6x$

**Term** a single number or a single variable or number & variable together  
\*separated by an operation\*

Examples:

$6x$ ,  $2$        $9w$ ,  $12$        $7$ ,  $3y$ ,  $6x$

6

x

+

2

## Coefficient

A number multiplying the variable

(The number directly in front of the variable)

## Variable

the unknown represented by a letter

## Operation

Add (+)  
Subtract (-)  
Multiply (x)  
Divide (÷)

## Constant

A number that stands alone

### 3.1 Algebraic Expressions

❖ When a term includes just a variable, the coefficient is 1.

○ Example:  $x = 1x$        $y = 1y$

Identify the terms, coefficients, and constants in each expression:

$5x + 13$   
 Terms:  $5x, 13$   
 Coefficients:  $5$   
 Constants:  $13$

$2z^2 + y + 3$   
 Terms:  $2z^2, y, 3$   
 Coefficients:  $2, 1$   
 Constants:  $3$

$15 + 3w + \frac{1}{2}$   
 Terms:  $15, 3w, \frac{1}{2}$   
 Coefficients:  $3$   
 Constants:  $15, \frac{1}{2}$

$c^2 + 9c$   
 Terms:  $c^2, 9c$   
 Coefficients:  $1, 9$   
 Constants: none

Write each algebraic expression using exponents:

$d \cdot d \cdot d \cdot d$        $d^4$   
 $a \cdot a \cdot b \cdot b \cdot b \cdot b \cdot b$        $a^2 \cdot b^5$

$1.5 \cdot h \cdot h \cdot h$        $1.5h^3 = 1.5h^3$   
 $2 \cdot j \cdot k \cdot k$        $2j^1k^2 = 2jk^2$

Evaluate the algebraic expressions:

To solve, substitute the value in for the variable.

Evaluate  $k + 10$  when  $k = 25$ .

$25 + 10$   
 $(35)$

Evaluate  $4n$  when  $n = 12$ .

means multiplication  
 $4n = 4 \cdot n$   
 $4 \cdot 12$   
 $(48)$

**Evaluate the algebraic expressions:**

To solve, substitute the values in for the variables.

Evaluate  $a \div b$  when  $a = 16$  and  $b = \frac{2}{3}$

$$16 \div \frac{2}{3}$$

K C F

$$8 \frac{16}{1} \cdot \frac{3}{2} = \frac{24}{1} = \textcircled{24}$$

Evaluate  $q + p$  when  $q = 11.2$  and  $p = 15.1$

$$11.2 + 15.1$$

$$\textcircled{26.3}$$

$$\begin{array}{r} 11.2 \\ + 15.1 \\ \hline 26.3 \end{array}$$

Evaluate  $cd$  when  $c = 8$  and  $d = 3$

$$8 \cdot 3$$

$$\textcircled{24}$$

Evaluate  $30 - 24 \div w$  when  $w = 6$

$$30 - 24 \div 6$$

$$30 - 4$$

$$\textcircled{26}$$

\*remember  
P  
E  
MD  
AS

Evaluate  $3j - 14$  when  $j = 5$

$$3 \cdot 5 - 14$$

$$15 - 14$$

$$\textcircled{1}$$

Evaluate  $z^2 + 8.5$  when  $z = 2$

$$2^2 + 8.5$$

$$4 + 8.5$$

$$\textcircled{12.5}$$

You are saving money to buy a skateboard. You begin with \$45 and you save \$3 each week. The expression  $45 + 3w$  gives the amount of money you save after  $w$  weeks.

Plug in for w

a) How much will you have after 4 weeks, 10 weeks, and 20 weeks?

4 weeks:  $45 + 3 \cdot 4$

$$45 + 12$$

$$\textcircled{\$57}$$

10 weeks:  $45 + 3 \cdot 10$

$$45 + 30$$

$$\textcircled{\$75}$$

20 weeks:  $45 + 3 \cdot 20$

$$45 + 60$$

$$\textcircled{\$105}$$

b) After 20 weeks, can you buy the skateboard? Explain.

\*skateboards cost \$125  
After 20 weeks, you would not be able to buy a skateboard because you only have \$105.