

## Chapter 6 Lesson 3:

### Variables and Expressions

**Algebra:** language of symbols including variables

**Variables:** is a symbol, usually a letter, used to represent a number.

**Algebraic Expressions:** contain at least one variable and at least one operation. Example:  $n + 2$

The letter  $x$  is often used as a variable. To avoid confusion with the symbol  $\times$ , there are other ways to show multiplication.

$$\begin{array}{c} 5 \cdot x \\ \uparrow \\ 5 \text{ times } x \end{array}$$

$$\begin{array}{c} 5(x) \\ \uparrow \\ 5 \text{ times } x \end{array}$$

$$\begin{array}{c} 5x \\ \uparrow \\ 5 \text{ times } x \end{array}$$

The variables in an expression can be replaced with any number. Once the variables have been replaced, you can **evaluate**, or find the value of, the algebraic expression.

Evaluate each expression if  $a = 6$ ,  $b = 4$ , and  $c = \frac{1}{3}$ .

1.)  $a + 8$

$$\begin{array}{r} 6 + 8 \\ 14 \end{array}$$

2.)  $a - b$

$$\begin{array}{r} 6 - 4 \\ 2 \end{array}$$

3.)  $9c$

$$\begin{array}{r} 9(\frac{1}{3}) \\ 3 \end{array}$$

$$\frac{9}{1} \cdot \frac{1}{3} = \frac{3}{1}$$

Evaluate each expression if  $x = 3$ ,  $y = 12$ , and  $z = 8$ .

1.)  $4z + 8 - 6$

$$\begin{array}{r} 4(8) + 8 - 6 \\ 32 + 8 - 6 \\ 40 - 6 \\ 32 \end{array}$$

2.)  $y^2 \div (3z)$

$$\begin{array}{r} 12^2 \div (3 \cdot 8) \\ 12^2 \div 24 \\ 144 \div 24 \\ 6 \end{array}$$

3.)  $7z \div 4 + 5x$

$$\begin{array}{r} 7(8) \div 4 + 5(3) \\ 56 \div 4 + 5(3) \\ 14 + 5(3) \\ 14 + 15 \\ 29 \end{array}$$