Name _____ Class _____ Date _____

Reteaching 1-2

Algebraic Expressions

OBJECTIVE: Simplifying and evaluating algebraic expressions

MATERIALS: None

To simplify an algebraic expression, combine like terms using the basic properties of real numbers. Like terms have the same variables raised to the same powers.

To evaluate an algebraic expression, replace the variables in the expression with numbers and follow the order of operations.

Example

Simplify the algebraic expression $3(4x + 5y) - 2(3x - 7y)$. Then evaluate the simplified expression for $x = 3$ and $y = -2$.

Simplify the algebraic expression using the basic properties of real numbers.

$$\begin{aligned} 3(4x + 5y) - 2(3x - 7y) &= 3(4x + 5y) + (-2)(3x + (-7)y) && \leftarrow \textbf{definition of subtraction} \\ &= 12x + 15y + (-6)x + 14y && \leftarrow \textbf{Distributive Property} \\ &= 12x + (-6)x + 15y + 14y && \leftarrow \textbf{Commutative Property of Addition} \\ &= (12 + (-6))x + (15 + 14)y && \leftarrow \textbf{Distributive Property} \\ &= 6x + 29y \end{aligned}$$

Now replace x with 3 and y with -2 in the simplified expression.

$6(3) + 29(-2) = 18 - 58 = -40$

Exercises

Simplify the algebraic expression. Then evaluate the simplified expression for the given values of the variable.

1. $(4x + 1) + 2x; x = 3$

2. $7(t + 3) - 11; t = 4$

3. $3y + 4z + 6y - 9z; y = 2, z = 1$

4. $2(u + v) - (u - v); u = 8, v = -3$

5. $5a^2 + 5a + a + 1; a = -2$

6. $6p^2 - (3p^2 + 2q^2); p = 1, q = 5$

7. $\frac{3}{4}(m + n) - \frac{1}{4}(m - n); m = 6, n = 2$

8. $\frac{r}{2} + \frac{s}{3} - \frac{r}{4} + \frac{1}{5}; r = -1, s = 0$