Review day
Evaluating and writing expressions,
simplifying expressions
and
factoring expressions

A *term* is a number, a variable, or the product of a number and variable(s).The two terms in $-2x + 4y$ are $-2x$ and $4y$.

A *coefficient* is a numerical factor of a term with a variable. In $5x$ and $(3 + 1)y$, the coefficients are 5 and $(3 + 1)$.

Terms with exactly the same variable factor are called *like terms*. In $-2x + 6y + 3x$, $-2x$ and $3x$ are like terms.

One way to *combine like terms* is by addition or subtraction.

- Add to combine like terms in $5a + a$.
  $5a + a = (5 + 1)a = 6a$
- Subtract to combine like terms in $7b - 10b$.
  $7b - 10b = (7 - 10)b = -3b$

To *simplify* an expression, combine its like terms.

Perform as many of its operations as possible.

Simplify: $6m + 10 - 2m + 4$

$= (6m - 2m) + (10 + 4)$

$= 4m + 14$

Simplify: $3(c - 6)$

$= 3c - 3(6)$

$= 3c - 18$

You can use the Distributive Property to rewrite an addition expression as a product of two factors. This process is called factoring. Use the greatest common factor (GCF) so the expression is factored completely.

Factor $9x + 12$.

GCF of 9 and 12 is 3. ← **Identify the GCF.**

$9x + 12 = 3 \cdot 3x + 3 \cdot 4$ ← **Factor each term by the GCF.**

$= 3(3x + 4)$ ← **Distributive Property**

The factored expression is $3(3x + 4)$.

Factor $15y - 5$.

GCF of 15 and 5 is 5. ← **Identify the GCF.**

$15y - 5 = 5 \cdot 3y - 5 \cdot 1$ ← **Factor each term by the GCF.**

$= 5(3y - 1)$ ← **Distributive Property**

The factored expression is $5(3y - 1)$.

To evaluate an *expression*, substitute a value for the *variable* and compute.

Evaluate $5y - 8$ for $y = 7$.

$5y - 8$

$5 \times 7 - 8$ ← **Substitute y with 7.**

$35 - 8 = 27$ ← **Compute.**

Solve. Let a = 3, b = 5 and c = 1/2

3a - b

4c + 5ab

6c - 11b

$\frac{4a}{2c}$

2abc

Circle the equation or equations that give the solution.

1. $y = 5$

   $y - 6 = 11$ $\quad$ $y + 15 = 20$ $\quad$ $6 + y = 60$

2. $n = 12$

   $4n = 48$ $\quad$ $n - 12 = 1$ $\quad$ $12 \div n = 1$

3. $t = 10$

   $5 + t = 10$ $\quad$ $t - 10 = 10$ $\quad$ $t \times 6 = 60$

4. $p = \frac{5}{12}$

   $p + \frac{7}{12} = 1$ $\quad$ $p - \frac{3}{12} = \frac{8}{12}$ $\quad$ $p - \frac{4}{12} = \frac{1}{12}$

5. $r = \frac{1}{8}$

   $r + \frac{1}{8} = \frac{1}{4}$ $\quad$ $r - \frac{3}{8} = \frac{1}{4}$ $\quad$ $\frac{5}{8} + r = \frac{7}{8}$

Circle the equation or equations that are satisfied by the given value of *s*.

6.	$s = 4$	$s - 2 = 3$	$10 - s = 6$	$3s = 9$
7.	$s = 10$	$s - 2 = 8$	$4 \times s = 36$	$s + 10 = 22$
8.	$s = \frac{7}{10}$	$s + \frac{4}{10} = 1$	$s - \frac{2}{10} = \frac{1}{2}$	$2 - s = 1\frac{1}{10}$

Fill in all the steps to simplify each expression from the box at the bottom of the page. Not all items will be used.

1. $3(9 - 6x)$

   _____

   _____

   _____

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

   _____

   _____

   _____

3. $8 + 3(3x - 2)$

   _____

   _____

   _____

4. $5(4 + 6x)$

   _____

   _____

   _____

$8 + 9x - 6$	$5(4) + 5(6x)$	$3(9) + 3(6x)$
$3(9) + 3(-6x)$	$-18x + 27$	$27 - 18x$
$27 + 18x$	$9x + 14$	$20 + 6x$
$20 + 30x$	$1 + 3x + 12$	$30x + 20$
$1 + 3(x) + 3(4)$	$8 + 9x - 2$	$3x + 13$
$9x + 2$	$8 + 3(3x) - 3(2)$	$1 + 3x + 4$

Factor these expressions

44d + 22c

32f - 24w

12e + 20r

36m + 27c

I'd like you to practice these skills on two Puzzle pages, which I will hand out now.

Name _____ Class _____ Date _____

Puzzle 2-1 Evaluating and Writing Algebraic Expressions

Write an algebraic expression to reflect each description. Write the letter of the correct answer above the exercise number at the bottom of the page.

1. Seven more than b bananas	r. $q - 5$
2. Four times c cookies	a. $2a - 3$
3. Five less than your quiz score q	a. $c - 4$
4. Two more than three times your age a	l. $4d$
5. Four less than c cups	a. $b + 7$
6. Five times the number of questions q	i. $d + 4$
7. Three less than two times your age a	b. $3a + 2$
8. Four miles farther than the distance d	v. $4c$
9. A hole four times deeper than d	e. $5q$

What did you use in each of your expressions?

___	___	___	___	___	___	___	___	___
5	2	1	3	8	7	4	9	6

Name _____ Class _____ Date _____

Puzzle 2-2

Simplifying Expressions

Match the expressions in the left column with their simplified versions in the right column. One from each column will have no match. Circle them.

1. $3x + 9 - 8x + 5$	**a.** $8x + 70$
2. $\frac{1}{2}(4x + 10) - 3x$	**b.** $12x - 8$
3. $5.8x - 10.4 + 6.2x + 2.4$	**c.** $-17x + 27$
4. $-14 + 7(2x + 3)$	**d.** $-x + 5$
5. $\frac{2}{3}(9x - 15) + 8$	**e.** $-14x + 7$
6. $3.9(2x + 18) + 0.2x - 0.2$	**f.** $-7x + 8$
7. $-\frac{3}{4}(24 + 16x) + 3x$	**g.** $-5x + 14$
8. $-14x + 3(-x + 6) + 9$	**h.** $-9x - 64$
9. $-7(x + 11) + 13 - 2x$	**i.** $6x - 2$
10. $1.8(3 - 2x) + 2.6 - 3.4x$	**j.** $-18 - 9x$