

Vocabulary to know!!!!

Term : one part of an expression

(separated by a + or -)

$$\text{Ex. } 3x + 2y - 6$$

Variable: a symbol, usually a letter, used to represent an unknown quantity

$$\text{Ex. } 8x - 6$$

↖ variable

Numerical Expression: Contains at least one number and operation

$$\text{Ex. } 5 + 12$$

Algebraic Expression: contains at least one operation, variable and number

$$\text{Ex. } -5x + 10 + 3x$$

Vocabulary

Like Terms

Examples

4x and -10x

15xy and 17xy

$-2x^2y$ and $7x^2y$

$-9xy^3$ and $13xy^3$

Vocabulary

Coefficient

Examples

4x and -10x

$-9xy^3$ and $13xy^3$

Vocabulary

Constant

Examples

$$4x + -10x - 13$$

$$-9xy^3 + 13xy + 5$$

$$3t + 6t$$

$$7f - 2f$$

$$10 + 14x$$

$$3n + 8n + n$$

$$5f - 7f + f$$

$$2x + 8 - 6$$

$$5x + 3x + 2$$

$$8p + 6 - 8p + 4$$

$$-b - 3b + 8a + 4$$

$$9y - 6x + 5y$$

Example 1: Any Order, Any Grouping Property with Addition

a. Rewrite $5x + 3x$ by combining like terms. Write the original expression and expand each term using addition.

b. Rewrite $5x - 3x$ by combining like terms. Write the original expression and expand each term using addition.

c. Find the sum of $2x + 1$ and $5x$.

d. Find the sum of $-3a + 2$ and $5a - 3$.

The Distributive Property

Example 1: Apply the distributive property to expand each expression. Substitute the given numerical values to demonstrate equivalency.

a) $2(x + 1)$, $x = 5$

b) $10(2c + 5)$, $c = 1$

c) $3(4f - 1)$, $f = 2$

d) $9(-3r - 11)$, $r = 10$

Example: Expand the expression $4(x + y + z)$

Exercise 2:

Expand the expression from a product to a sum by removing grouping symbols and using the distributive property:

$$3(x + 2y + 5z)$$

Multiplicative Inverse: The reciprocal of a number

Ex: What is the multiplicative inverse of ...

a) 5 b) -6 c) $\frac{1}{3}$

Example:

Rewrite the expression $(6x + 15) \div 3$ in standard form using the distributive property.
(multiply by the reciprocal, then distribute)

Exercise 1:

$$(2b + 12) \div 2$$

$$(20r - 8) \div 4$$

$$(49g - 7) \div 2$$

$$(14g + 22h) \div \frac{1}{2}$$

What is a FACTOR??

Numbers you multiply together to get another number

What are the factors of 36?

What are the factors of 24?

What are the common factors of 36 and 24?

What is the *GREATEST* common factor of 36 and 24?

Exercise 1: Rewrite the expressions as a product of two factors.

(Factor the expression)

a. $72m + 8$ $\underline{\hspace{1cm}} \left(\underline{\hspace{1cm}} + \underline{\hspace{1cm}} \right)$

b. $55a + 11$ $\underline{\hspace{1cm}} \left(\underline{\hspace{1cm}} + \underline{\hspace{1cm}} \right)$

c. $36z + 72$ $\underline{\hspace{1cm}} \left(\underline{\hspace{1cm}} + \underline{\hspace{1cm}} \right)$

d. $3r + 3s$ $\underline{\hspace{1cm}} \left(\underline{\hspace{1cm}} + \underline{\hspace{1cm}} \right)$

e. $12q - 15$ $\underline{\hspace{1cm}} \left(\underline{\hspace{1cm}} - \underline{\hspace{1cm}} \right)$

Exercise 2: Rewrite the expressions
as a product of two factors.

a. $24d + 8e + 6$

$$\underline{\hspace{2cm}} \left(\underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \right)$$

b. $48j + 60k + 24$

$$\underline{\hspace{2cm}} \left(\underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \right)$$

c. $18x + 24y - 36$

$$\underline{\hspace{2cm}} \left(\underline{\hspace{2cm}} + \underline{\hspace{2cm}} - \underline{\hspace{2cm}} \right)$$

Exercise 3:

For each expression, write each sum as a product of two factors

a. $x \cdot 3 + 5 \cdot 3$

b. $x \cdot 4 + y \cdot 4$

c. $(x + 5) + (x + 5) + (x + 5)$

d. $(x - 6) + (x - 6) + (x - 6) + (x - 6) + (x - 6)$

e. $2 \cdot 2 + (5 + 2) + (5 \cdot 2)$

Exercise 4:

A new miniature golf and arcade opened up in town. A group of 6 friends purchased a package deal. It includes 2 rounds of golf and 20 arcade tokens, plus \$3.00 off the regular price. Let g represent the cost of a round of golf, and let t represent the cost of a token. Write two different expressions that represent the total amount this group spent. Explain how each expression describes the situation in a different way.

Exercise 5:

Rewrite $5a - (a - 3b)$ in standard form. Justify each step applying the rules for subtracting and the distributive property.

Exercise 6:

Expand each expression and collect like terms

a. $-3(2p - 3q)$

b. $-a - (a - b)$

Exit Ticket:

1) $25x + 100y$

2) $16m - 48$

Example 1: Write the sum, by combining like terms and removing parentheses.

a) $2x$ and $-2x + 3$

b) $2x + 7$ and the opposite of $2x$

c) the opposite of $(5x - 1)$ and $5x$

Exercise 1: Write the sum, by collecting like terms and removing parentheses.

work at your tables

a) -4 and $4b + 4$

b) $3x$ and $1 - 3x$

c) the opposite of $4x$ and $-5x + 4$

d) the opposite of $(-7 - 4v)$ and $-4v$

Example 2: Find the product of each problem

- $\left(\frac{3}{4}\right) \times \left(\frac{4}{3}\right) =$
 - $4 \times \frac{1}{4} =$
 - $\frac{1}{9} \times 9 =$
 - $\left(-\frac{1}{3}\right) \times -3 =$
 - $\left(-\frac{6}{5}\right) \times \left(-\frac{5}{6}\right) =$
- What are these called?

Exercise 2: Write the product of each expression.

a) The reciprocal of 3 and $(-6y - 3x)$

b) The multiplicative inverse of 4 and $(4h - 20)$

c) The multiplicative inverse of $-\frac{1}{6}$ and $(2 - \frac{1}{6}j)$

Notes - Lesson 6: Collecting Rational Number Like Terms – Day 1

Warm up:

1) Write the sum of $10x + 3$ and -3 .

2) Write the product of $9 - b$ and the multiplicative inverse of 9.

Example 1

Rewrite the expression in standard form by collecting like terms.

$$\frac{2}{3}n - \frac{3}{4}n + \frac{1}{6}n + 2\frac{2}{9}n$$

Exercise 1

For the following exercises, predict how many terms the resulting expression will have after collecting like terms. Then, write the expression in standard form by collecting like terms.

a. $\frac{2}{5}g - \frac{1}{6} - g + \frac{3}{10}g - \frac{4}{5}$

b. $i + 6i - \frac{3}{7}i + \frac{1}{3}h + \frac{1}{2}i - h + \frac{1}{4}h$

Example 2

At a store, a shirt was marked down in price by \$10.00. A pair of pants doubled in price. Following these changes, the price of every item in the store was cut in half. Write two different expressions that represent the new cost of the items, using s for the cost of each shirt and p for the cost of a pair of pants. Explain the different information each one shows.

Exercise 2

Write two different expressions that represent the total cost of the items if tax was $\frac{1}{10}$ of the original price. Explain the different information each shows.

Example 3

Write this expression in standard form by collecting like terms. Justify each step.

$$5\frac{1}{3} - \left(3\frac{1}{3}\right)\left(\frac{1}{2}x - \frac{1}{4}\right)$$

Exercise 3

Rewrite the following expressions in standard form by finding the product and collecting like terms.

a. $-6\frac{1}{3} - \frac{1}{2}\left(\frac{1}{2} + y\right)$

b. $\frac{2}{3} + \frac{1}{3}\left(\frac{1}{4}f - 1\frac{1}{3}\right)$

Day 2 – Notes Lesson 6: Collecting Rational Number Like Terms

Warm up:

Solve each problem.

1. $2\frac{2}{3} - 1\frac{1}{2} - \frac{4}{5}$

2. $\frac{1}{5} + (-4)$

3. $4\left(\frac{3}{5}\right)$

Example 4

Model how to write the expression in standard form using rules of rational numbers.

$$\frac{x}{20} + \frac{2x}{5} + \frac{x+1}{2} + \frac{3x-1}{10}$$

Evaluate the original expression and the answer when $x = 20$. Do you get the same number?

Exercise 4

Rewrite the following expression in standard form by finding common denominators and collecting like terms.

$$\frac{2h}{3} - \frac{h}{9} + \frac{h-4}{6}$$

Example 5

Rewrite the following expression in standard form.

$$\frac{2(3x - 4)}{6} - \frac{5x + 2}{8}$$

Exercise 5

Write the following expression in standard form.

$$\frac{2x - 11}{4} - \frac{3(x - 2)}{10}$$

Examples to work on:

a. $\frac{3n}{8} - \frac{n}{4} + 2\frac{n}{2}$

b. $\frac{4}{5} \left(\frac{1}{4}c - 5 \right)$

c. $-p + \frac{3}{5}q - \frac{1}{10}q + \frac{1}{9} - \frac{1}{9}p + 2\frac{1}{3}p$

d. $2\frac{4}{5}v - \frac{2}{3}(4v + 1\frac{1}{6})$

e. $\frac{9w}{6} + \frac{2w-7}{3} - \frac{w-5}{4}$

f. $\frac{9x-4}{10} + \frac{3x+2}{5}$