

5-30-18

Aim: SWBAT review.

HW: Final Exam Tuesday June 12th

Textbook due on or before the final exam

Do Now: Review Packet and Calculator

**Evaluating Expressions using the Order of Operations:** You MUST show your substitution, but you can use your calculator to compute the answer.

Evaluate each expression when  $a = 2$ ,  $b = -3$ , and  $c = \frac{1}{3}$

95)  $4a + c$   
 $4 \cdot 2 + \frac{1}{3}$   
 $\boxed{8\frac{1}{3}}$

96)  $2b - 3c$   
 $2 \cdot -3 - 3 \cdot \frac{1}{3}$   
 $\boxed{-7}$

97)  $\frac{c}{4} + \frac{2}{3}$   
 $\frac{\frac{1}{3}}{4} + \frac{2}{3}$   
 $\boxed{\frac{3}{4}}$

98)  $2ab + 2bc$   
 $2 \cdot 2 \cdot -3 + 2 \cdot -3 \cdot \frac{1}{3}$   
 $\boxed{-14}$

Evaluate each expression when  $x = 1.6$  and  $y = -\frac{1}{2}$

99)  $x - y$   
 $1.6 - (-\frac{1}{2})$   
 $\boxed{2.1}$

100)  $3x + 2y$   
 $3(1.6) + 2(-\frac{1}{2})$   
 $\boxed{3.8}$

101)  $\frac{x}{2} + y$   
 $\frac{1.6}{2} + (-\frac{1}{2})$   
 $\boxed{0.3}$

102)  $25 - x - 6y$   
 $25 - 1.6 - 6(-\frac{1}{2})$   
 $\boxed{26.4}$

### Unit 2: Expressions, Equations & Inequalities

**When translating into mathematical expressions . . .**

- Identify the key words
- Translated in the exact order they are read
- Switch the order ONLY when you read: "less than", "more than", "fewer than", "subtracted from" and "taken away from"
- Place parentheses around sums and differences

**Translate each verbal phrase or sentence into an algebraic expression.**

1) 12 more than a number  $n$                        $n + 12$

2) A number,  $n$ , increased by seven                       $n + 7$

3) The product of 15 and  $x$                        $15x$

4) Twice  $y$  decreased by 20                       $2y - 20$

5) Seven more than the quotient of  $x$  and  $-2$ .                       $\frac{x}{-2} + 7$

6) The (difference) of twice  $n$  and three                       $(2n - 3)$

7) Three times the (sum) of 12 and  $x$                        $3(12 + x)$

**Term** - a part of an expression that is separated by a "plus" or "minus" sign.

Ex:  $3x + 4y \rightarrow 3x$  is a term &  $4y$  is a term

**Coefficient** - a number in front of a variable

Ex:  $4n \rightarrow 4$  is the coefficient and  $n$  is the variable

**Constant Term** - a term that has a number but no variable.

Ex: 5, 7, 100, 2,000

**Like Terms** - terms with the **EXACT** same variables and **EXACT** same exponents

Examples:  $5y$  and  $6y$        $5x^2$  and  $6x^2$        $10$  and  $-2$

Non-examples:  $5x$  and  $3y$        $2x$  and  $3$        $-4x$  and  $3x^2$

List the terms, like terms, coefficient(s), and constant(s) for the following expressions.

8)  $5x + 2y - 1x + 3y - 7$

Terms:  $5x$ ,  $2y$ ,  $-x$ ,  $3y$ ,  $-7$

Like Terms:  $5x$  and  $-x$ ;  $2y$  and  $3y$

Coefficient(s):  $5$ ,  $-1$ ,  $2$ ,  $3$

Constant(s):  $-7$

9)  $-4a - 10b + 8 - 2a + 7$

Terms:  $-4a$ ,  $-10b$ ,  $8$ ,  $-2a$ ,  $7$

Like Terms:  $-4a$  and  $-2a$ ;  $8$  and  $7$

Coefficient(s):  $-4$ ,  $-10$ ,  $-2$

Constant(s):  $8$ ,  $7$

### DISTRIBUTIVE PROPERTY!!!

$$a(b + c) = ab + ac$$

Make sure you multiply every number in the group (parentheses) by that number.

Ex.  $-2(x + 3) = -2 \cdot x + -2 \cdot 3$   
 $= -2x - 6$

If distributing a negative value, all the signs on the inside become opposite.

Rewrite using the Distributive property.

10.  $5(2x + 6)$   
 $10x + 30$

11.  $-5(2x + 6)$   
 $-10x - 30$

12.  $5(2x - 6)$   
 $10x - 30$

13.  $-5(2x - 6)$   
 $-10x + 30$

14.  $x(y + z)$   
 $xy + xz$

15.  $x(-y + z)$   
 $-xy + xz$

16.  $-x(y - z)$   
 $-xy + xz$

17.  $-x(-y - z)$   
 $xy + xz$

**Simplify Expressions**

- STEP 1 → Get rid of parentheses by using the Distributive Property
- STEP 2 → Combine like terms (if they have the same variable raised to the same power)

Simplify each expression.

18)  $3x + 4x + 2$

$7x + 2$

19)  $-9y + 7y + 5z$

$-2y + 5z$

20)  $5y + 9z - 7 - 3y$

$2y + 9z - 7$

21)  $2x - y + 3x + 9y - 6$

$5x + 8y - 6$

22)  $-5a - 11b + 4a - 2b + 7$

$-a - 13b + 7$

23)  $5(4 + 2y) - 27 - 3y$

$20 + 10y - 27 - 3y$

$7y - 7$

**Factoring**The **first step** to factoring is to find the GCF of the terms:The **second step** to factoring is to factor out the GCF.

- First write the GCF, then begin your parenthesis.
- To figure out what goes inside the parenthesis, divide each term by the GCF
- Remember the final answer will look like the distributive property.

Example: Factor the expression  $10x + 20$ Step 1: Find the GCFFactors of: 10: 1, 2, 5, **10**  
20: 1, 2, 4, 5, **10**, 20

These two terms DO NOT have a variable in common, so the GCF is 10.

Step 2: Factor

10 (  $x + 2$  )

10x divided by 10 equals x.  
20 divided by 10 equals positive 2

Find the Greatest Common Factor (GCF) of each pair of terms.

24) 25x and 30y

GCF: 5

25) 3x and 21xy

GCF: 3x

26) 4y and 16

GCF: 4

27) 12y and 28xy

GCF: 4y

Factor each expression. Remember, when you factor you are dividing each term by the GCF. Your final answer should look like the Distributive Property.

28)  $-15m + 50$  GCF: 5    29)  $2x - 4xy$  GCF: 2x    30)  $15a - 20b + 10c$  GCF: 5

$5(-3m + 10)$

$2x(1 - 2y)$

$5(3a - 4b + 2c)$

Simplify and Factor. (First simplify each expression, THEN factor.)

31)  $8x + 14 - 2x + 4$

$$\begin{array}{r} 6x + 18 \\ 6(x + 3) \end{array}$$

32)  $6x + 15y + 12y + 3x$

$$\begin{array}{r} 9x + 27y \\ 9(x + 3y) \end{array}$$

33)  $8x - 2(3x - 4) + 2$

$$\begin{array}{r} 8x - 6x + 8 + 2 \\ 2x + 10 \\ 2(x + 5) \end{array}$$

### Solving Multi-Step Equations

**Step 1: Get rid of any parentheses**

How? Use the **DISTRIBUTIVE PROPERTY!!!**

$$a(b + c) = ab + ac$$

Make sure you multiply every number in the group (parentheses) by that number.

Ex.  $-2(3 + x) = -6 - 2x$

**Step 2: Combine Like-Terms on the Same side of = sign.**

(Same Side Use Same Operation)

Ex.  $\underbrace{-5x + 2x}_{-3x} + 12 = -10x + \underbrace{16 + 17}_{33}$   
 $-3x + 12 = -10x + 33$

**Step 3: Get All Variables on One Side & Constants on the Other Side**

(Opposite Sides Use Opposite Operations)

Ex.  $-3x + 12 = -10x + 33$   
 $\begin{array}{r} +10x \quad = +10x \\ \hline 7x + 12 = 33 \\ -12 = -12 \\ \hline 7x = 21 \end{array}$

**Step 4: Solve for the Variable**

Ex.  $\frac{7x}{7} = \frac{21}{7}$   
 $x = 3$

**\*\* 3-Step Check:**

- 1) Rewrite the equation
- 2) Replace the variable
- 3) **PROVE** (Do the math!)

Solve and check each equation algebraically. Show all work!

34)  $4c - 6 = 2$

$$\begin{array}{r} 4c - 6 = 2 \\ +6 \quad +6 \\ \hline 4c = 8 \\ \frac{4c}{4} = \frac{8}{4} \\ c = 2 \end{array}$$

35)  $-4 = 2x - 2$

$$\begin{array}{r} -4 = 2x - 2 \\ +2 \quad +2 \\ \hline -2 = 2x \\ \frac{-2}{2} = \frac{2x}{2} \\ -1 = x \end{array}$$

36)  $-5 = 3m - 14$

$$\begin{array}{r} -5 = 3m - 14 \\ +14 \quad +14 \\ \hline 9 = 3m \\ \frac{9}{3} = \frac{3m}{3} \\ 3 = m \end{array}$$

37)  $0 = 8z + 8$

$$\begin{array}{r} 0 = 8z + 8 \\ -8 \quad -8 \\ \hline -8 = 8z \\ \frac{-8}{-8} = \frac{8z}{-8} \\ -1 = z \end{array}$$

**\*\* Checks for #'s 1 - 4 on Next Slide \*\***

check #1

$$\textcircled{1} \quad 4c - 6 = 2$$

$$\textcircled{2} \quad \underline{4 \cdot 2} - 6 \stackrel{?}{=} 2$$

$$\textcircled{3} \quad 8 - 6 \stackrel{?}{=} 2$$
$$2 = 2 \checkmark$$

check #2

$$\textcircled{1} \quad -4 = 2x - 2$$

$$\textcircled{2} \quad -4 \stackrel{?}{=} \underline{2 \cdot -1} - 2$$

$$\textcircled{3} \quad -4 \stackrel{?}{=} -2 - 2$$
$$-4 = -4 \checkmark$$

check #3

$$\textcircled{1} \quad -5 = 3m - 14$$

$$\textcircled{2} \quad -5 \stackrel{?}{=} \underline{3 \cdot 3} - 14$$

$$\textcircled{3} \quad -5 \stackrel{?}{=} 9 - 14$$
$$-5 = -5 \checkmark$$

check #4

$$\textcircled{1} \quad 0 = 8z + 8$$

$$\textcircled{2} \quad 0 \stackrel{?}{=} \underline{8 \cdot -1} + 8$$

$$\textcircled{3} \quad 0 \stackrel{?}{=} -8 + 8$$
$$0 = 0 \checkmark$$

Solve and check each equation algebraically.

38)  $-1 = 4 - 5x$

$$\begin{array}{r} -1 = 4 - 5x \\ -4 \quad -4 \\ \hline \end{array}$$

$$\begin{array}{r} -5 = -5x \\ -5 \quad -5 \\ \hline \end{array}$$

$$1 = x$$

40)  $\frac{1}{3}x + 2.5 = 3.7$

$$\begin{array}{r} \frac{1}{3}x + 2.5 = 3.7 \\ -2.5 \quad -2.5 \\ \hline \end{array}$$

$$\begin{array}{r} \frac{1}{3}x = 1.2 \\ \frac{3}{1} \cdot \frac{1}{3}x = 1.2 \cdot \frac{3}{1} \\ \hline \end{array}$$

$$x = 3.6$$

42)  $-3(2x + 7) = 3$

$$\begin{array}{r} -6x - 21 = 3 \\ +21 \quad +21 \\ \hline \end{array}$$

$$\begin{array}{r} -6x = 24 \\ -6 \quad -6 \\ \hline \end{array}$$

$$x = -4$$

44)  $\frac{1}{4}(8x + 20) = 15 + 5$

$$\begin{array}{r} 2x + 5 = 20 \\ -5 \quad -5 \\ \hline \end{array}$$

$$\begin{array}{r} 2x = 15 \\ \frac{2}{2} \quad \frac{2}{2} \\ \hline \end{array}$$

$$x = 7\frac{1}{2} \text{ or } 7.5$$

46)  $-6 - 11 = 9x + 1 - 7x$

$$\begin{array}{r} -6 - 11 = 2x + 1 \\ -17 = 2x + 1 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\begin{array}{r} -18 = 2x \\ \frac{-18}{2} = \frac{2x}{2} \\ \hline \end{array}$$

$$-9 = x$$

39)  $12 - 3x = 6$

$$\begin{array}{r} 12 - 3x = 6 \\ -12 \quad -12 \\ \hline \end{array}$$

$$\begin{array}{r} -3x = -6 \\ -3 \quad -3 \\ \hline \end{array}$$

$$x = 2$$

41)  $\frac{1}{2}m + \frac{3}{5} = \frac{1}{4}$

$$\begin{array}{r} \frac{1}{2}m + \frac{3}{5} = \frac{1}{4} \\ -\frac{3}{5} \quad -\frac{3}{5} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{1}{2}m = -\frac{7}{20} \\ \frac{2}{1} \cdot \frac{1}{2}m = -\frac{7}{20} \cdot \frac{2}{1} \\ \hline \end{array}$$

$$m = -\frac{7}{10}$$

43)  $6(x + 1) = 5(2x + 6)$

$$\begin{array}{r} 6x + 6 = 10x + 30 \\ -10x \quad -10x \\ \hline \end{array}$$

$$\begin{array}{r} -4x + 6 = 30 \\ -6 \quad -6 \\ \hline \end{array}$$

$$\begin{array}{r} -4x = 24 \\ -4 \quad -4 \\ \hline \end{array}$$

$$x = -6$$

45)  $3y - 17 = 2y + 13$

$$\begin{array}{r} 3y - 17 = 13 \\ +17 \quad +17 \\ \hline \end{array}$$

$$\begin{array}{r} 3y = 30 \\ \frac{3y}{3} = \frac{30}{3} \\ \hline \end{array}$$

$$y = 10$$