

6-6-19

Aim: SWBAT review.

HW: Final Exam Wednesday June 19th

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 $15x$ $15 \cdot x$ $15(x)$
- 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) $5(4 + 2y) - 27 - 3y$

$20 + 10y - 27 - 3y$

$7y - 7$

FactoringThe **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: Factor10 ($x + 2$)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

1, 2, 3, 4, 6, 12

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) $\frac{-15m}{5} + \frac{50}{5}$ GCF: 5

$5(-3m + 10)$

GCF

29) $\frac{2x}{2x} - \frac{4xy}{2x}$ GCF: 2x

$2x(1 - 2y)$

30) $15a - 20b + 10c$ GCF: 5

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

GCF

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

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

$$\begin{aligned} &\rightarrow \underline{6x} + \underline{18} \\ &\quad \underline{6(x + 3)} \end{aligned}$$

GCF

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

$$\begin{aligned} &9x + 27y \\ &9(x + 3y) \end{aligned}$$

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

$$\begin{aligned} &\underline{8x} - \underline{6x} + \underline{8} + \underline{2} \\ &2x + 10 \\ &2(x + 5) \end{aligned}$$

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. $-3x + 12 = -10x + 33$
 $\quad + 10x \quad = + 10x$
 $\hline 7x + 12 = 33$
 $\quad - 12 = -12$
 $\hline 7x = 21$

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) $4c - 6 = 2$

$$\begin{aligned} &4c - 6 = 2 \\ &\quad + 6 \quad + 6 \\ &\hline &4c = 8 \\ &\quad \div 4 \quad \div 4 \\ &\hline &c = 2 \end{aligned}$$

35) $-4 = 2x - 2$

$$\begin{aligned} &-4 = 2x - 2 \\ &\quad + 2 \quad + 2 \\ &\hline &-2 = 2x \\ &\quad \div 2 \quad \div 2 \\ &\hline &-1 = x \end{aligned}$$

36) $-5 = 3m - 14$

$$\begin{aligned} &-5 = 3m - 14 \\ &\quad + 14 \quad + 14 \\ &\hline &9 = 3m \\ &\quad \div 3 \quad \div 3 \\ &\hline &3 = m \end{aligned}$$

37) $0 = 8z + 8$

$$\begin{aligned} &0 = 8z + 8 \\ &\quad - 8 \quad - 8 \\ &\hline &-8 = 8z \\ &\quad \div 8 \quad \div 8 \\ &\hline &-1 = z \end{aligned}$$

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

check #1

$$\begin{aligned} \textcircled{1} \quad & 4c - 6 = 2 && \text{Rewrite} \\ \textcircled{2} \quad & \underline{4 \cdot 2} - 6 = 2 && \text{Substitute} \\ \textcircled{3} \quad & 8 - 6 = 2 && \text{Evaluate} \\ & 2 = 2 \checkmark && \text{PEMDAS} \end{aligned}$$

check #2

$$\begin{aligned} \textcircled{1} \quad & -4 = 2x - 2 \\ \textcircled{2} \quad & -4 = \underline{2 \cdot -1} - 2 \\ \textcircled{3} \quad & -4 = -2 - 2 \\ & -4 = -4 \checkmark \end{aligned}$$

check #3

$$\begin{aligned} \textcircled{1} \quad & -5 = 3m - 14 \\ \textcircled{2} \quad & -5 = \underline{3 \cdot 3} - 14 \\ \textcircled{3} \quad & -5 = 9 - 14 \\ & -5 = -5 \checkmark \end{aligned}$$

check #4

$$\begin{aligned} \textcircled{1} \quad & 0 = 8z + 8 \\ \textcircled{2} \quad & 0 = \underline{8 \cdot -1} + 8 \\ \textcircled{3} \quad & 0 = -8 + 8 \\ & 0 = 0 \checkmark \end{aligned}$$