Warm Up:

Alg. 1: 1.0a Integers & Combine Like Terms (not in textbook)

I will be able to:
- ✓ Determine sums, differences, products & quotients of integers
- ✓ Combine Like Terms

A. Adding/Subtracting/Multiplying/Dividing:

Rules for Integer Operations		
Adding Integers	Subtracting Integers	Multiplying and Dividing

SAME SIGN
  ADD the numbers
  KEEP the SIGN
 	
DIFFERENT SIGN
  SUBTRACT the numbers
  TAKE the sign of the "BIGGER" #
	ADD its opposite
	KEEP first number
	CHANGE to addition
	OPPOSITE of the 2nd number
	
	You may have heard of this as:
	Keep-Change-Change
	From a previous teacher!
		*If only TWO numbers:
		 SAME SIGN: Always positive
		 DIFFERENT SIGN: Always negative
		
		*If more than two numbers are multiplied:
		EVEN # of Negative signs:
		                    Always **positive**
		ODD # of Negative signs:
		                    Always **negative**

Practice Examples: **YOU MUST WRITE OUT THE PROBLEM in order to get full credit on your notes**

1)   5)

                                                                9)

2)   6)

                                                                10)

3)   7)

4)   8)

Must show *ALL* Work for credit!

NOTES NAME: _____ Pd: _____

B. Use substitution to simplify the following.

   Given: $a = -2$ $b = 3$ $c = -4$ $d = 5$

1)

2)

3)

4)

C. COMBING LIKE TERMS with Addition and Subtraction

Must have SAME variable with same exponent

Example A: 3a + 2b + 5   This is already simplified

Example B: 3a + 2b + 5 –a + 4b – 3 = _____
             Note: We always put out final answer in alphabetical order with the constant last

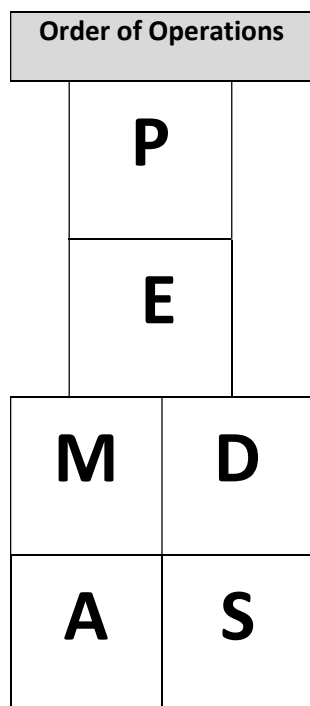Practice Examples: **YOU MUST WRITE OUT THE PROBLEM in order to get full credit on your notes**

1)

2)

3)

NAME: _____ Pd: _____

Warm Up:

Algebra 1: 1.0b Order of Operations (not in textbook)

DOK 1: Apply

I will be able to use the order of operations to simplify expressions

Order of Operations

P

E

M	D
A	S

Let's try one together:

A:

$$2^3 + 4[-12 + 3] + 9 \div 3$$

Practice Problems (Be sure to write down original problem!!)

1:   2:

3.

4.

5.

6.

Must show *ALL* Work for credit!

Try it out:

7)   8)

NAME: _____

Warm Up:

Algebra 1: 1.1 Solving One-Step Equations (not in textbook)

DOK 1: Solve

I will be able to use properties of real numbers to solve one-step equations involving adding, subtracting, multiplying and dividing.

What does it mean to solve an equation?

Properties of Equality

- Addition Property of Equality: you can add the same number to both sides of an equation, and the statement will still be true.
- Subtraction Property of Equality: you can subtract the same number from both sides of an equation, and the statement will still be true.
- Multiplication Property of Equality: you can multiply the same number to both sides of an equation, and the statement will still be true.
- Division Property of Equality: you can divide the same number from both sides of an equation, and the statement will still be true.

-How do we divide a fraction from both sides?

Practice Problems: Solve the following equations. Always check your work.

1:   2:

3:   4:

Must show ALL Work for credit!

5:   6:

7:   8:

9:   10:

11:   12:

Try it Out:

NAME: _____

Warm Up:

Algebra 1: 1.2 Solving Two-Step Equations (textbook section 1.1)

DOK 1: Apply

You will use the properties of equality to solve equations

A _____of an equation is a value for the variable that makes the equation **TRUE**.
To determine the solution of an equation, you will use the Properties of Equality.

1) Consider the equation: $2x + 4 = 12$
   a. What properties would we need to use to solve this equation?

   b. Let's solve it: $2x + 4 = 12$

2) Consider the equation: $-3r + 5 = -16$
   a. What properties would we need to use to use to solve this equation?

   b. Let's solve it: $-3r + 5 = -16$

3) Justify each step and verify that your solution makes the equation true.

A) $18 = 3x - 6$

B) $8 - 4t = -16$

4) a. What properties would we need to use to rewrite this equation so we can recognize the solution? $\dfrac{m}{7} + 4 = 8$

b. Solve it: $\dfrac{m}{7} + 4 = 8$

5) Solve the following equations. Justify each step and verify that your solution makes the equation true.

A) $-6 + \dfrac{n}{2} = 8$

B) $1 = \dfrac{k}{12} + 5$

C) $8 = \dfrac{c}{24} + 4$

6) Now consider this equation: $\dfrac{x+2}{9} = 5$ What is different about it? How does that impact how we solve it?

7) Solve the following equations. Justify each step and verify that your solution makes the equation true.

A) $\dfrac{x+2}{9} = 5$

B) $2 = \dfrac{y+9}{3}$

C) $\dfrac{b-7}{2} = 6$

NAME: _____

Warm Up:

Algebra 1: 1.3 Justifications and Equivalent Equations (textbook section 1.1)
DOK 2: Analyze
You will use the properties of equality to identify equivalent equations.

List the four properties of equality we used in our last lesson:

_____, _____, _____, _____,

The following properties of real numbers also ***preserve equivalence*** (do not change the result) for TRUE equations:

Properties	Numbers	Algebra
Commutative: In addition and multiplication terms can be rearranged in any order	$3+4=4+3$ $2 \cdot 6 = 6 \cdot 2$	$a+b=b+a$ $ab=ba$
Associative: In addition and multiplication terms can be regrouped	$(13+4)+16=13+(4+16)$ $2 \cdot (5 \cdot 16)=(2 \cdot 5) \cdot 16$	$(a+b)+c=a+(b+c)$ $a(bc)=(ab)c$
Distributive: Expressions can be simplified by multiplying every term inside the parenthesis by the multiplier	$5x(x+2)=5x^2+10x$	$a(b+c)=ab+ac$
Symmetric: The left-hand side of the equation can be moved to the right-hand side, if the right-hand side is moved to the left-hand side.	$4=x$ $x=4$	$a=b$ $b=a$
Simplify: Using order of operations to simplify any part of the expression and/or combine like terms.	$(5)(-4)(8)=(-20)(8)$	$x+2x+5=3x+5$

1) Name the property that would make the following equations equivalent:

a) $3x=1+x$ and $3x=x+1$

b) $3x=(1+x)+5$ and $3x=1+(x+5)$

c) $3x-1=5$ and $3x=6$

d) $3(x+1)=24$ and $3x+3=24$

e) $3x+8=10$ and $3x=2$

f) $3=x$ and $x=3$

NAME: _____

g) $3x = 12$ and $x = 4$ h) $\dfrac{x}{3} = 12$ and $x = 36$

i) $x + 3 = 9$ and $3 + x = 9$ j) $-7(x-1) = 18$ and $-7x + 7 = 18$

2) <u>Without</u> solving the equations, match those with the same solution. Use the properties of equality to justify how you know that they had the same solution.

Match 1: _____&_____ Justification:_____

Match 2: _____&_____ Justification:_____

Match 3: _____&_____ Justification:_____

Match 4: _____&_____ Justification:_____

A.	$2x - 3 = 5x + 7$
B.	$2x + 3 = 5x - 7$
C.	$10x - 8 = 6x + 10$
D.	$4x - 4 = 6x + 5$
E.	$6x + 5 = 4x - 4$
F.	$2x - 2 = 5x - 12$
G.	$4x - 6 = 10x + 14$
H.	$5x - 4 = 3x + 5$

NOTES   NAME: _____

Warm Up:

Algebra 1: 1.4 Solving Multi-Step Equations (textbook section 1.1)
DOK 2: Analyze
You will use properties of equivalence to solve equations.

Steps for solving multi-step equations:
1. Distribute to eliminate parenthesis
2. Combine like terms on the SAME side of the equals
3. Move constant (add or subtract) *
4. Move coefficient (multiply or divide) *   *If a fraction is involved, you may have to
                                                             do step 4 then step 3*

Examples: Solve for the variable. Show all steps for credit!!

1) $2(6x+3)=24$ 2) $15=-3(x-1)+9$

3) $2(x-3)=9$ 4) $4b+16+2b=46$

5) $9k - 3(k + 2) = 15$

6) $\dfrac{4(b + 2)}{-2} = 10$

7) $\dfrac{4(b + 2)}{-2} + 5 = 10$

TRY IT: $4(x - 5) + 3x = 29$

Algebra 1: 1.0 to 1.4 REVIEW for IN CLASS

The following problems have errors. For each problem circle and explain the error, then solve the problem correctly.

1:   $12 - 3y = 15$

$$3y = 3$$

$$y = 1$$

2:

$$\frac{m}{3} - 9 = -21$$

$$m - 9 = -63$$

$$m = -54$$

Simplify each expression completely.

3:   $20 - 2^2 + 6[3 + 2(-4)]$

4:   $8 + 12 \div 4 \cdot 3^2$

5:   $\dfrac{3^2 - 5}{(2)(-3)}$

6:   $3\left(\dfrac{3^2 - 5}{(2)(-3) + 15}\right)$

Evaluate the following for $x = 4$, $y = -2$, and $z = 3$.

7:   $\dfrac{xy - 3z}{5}$

8:   $-z^3 - 2x + y$

9:   $-3x - 2z - y$

Use the properties of equality to solve each equation.

10:   $-3x = 18$

11:   $-4 = 2 + x$

12:   $\dfrac{x}{6} + 4 = 15$

13:   $2(8 + k) = 22$

Name: _____

14: $42 = -2d + 6$

15: $2(-3c - 5) = 2$

16: $m + 5(m - 1) = 7$

17: $9 - c = -13$

18: $-13 = 2b - b - 10$

19: $-4 = 2k + 16 - 4k$

20: Give a justification for each step using properties:

$\qquad 4(b - 5) + 3b = 29 \qquad$ Given

a. $\quad 4b - 20 + 3b = 29 \qquad$ a. _____

b. $\quad 7b - 20 = 29 \qquad$ b. Simplify

c. $\qquad 7b = 49 \qquad$ c. _____

d. $\qquad b = 7 \qquad$ d. _____

21: Give a justification for each step using properties:

$\dfrac{2(x + 4)}{-2} = 10 \qquad$ Given

a. $\quad 2(x + 4) = -20 \qquad$ a. _____

b. $\quad 2x + 8 = -20 \qquad$ b. _____

c. $\qquad 2x = -28 \qquad$ c. _____

d. $\qquad x = -14 \qquad$ d. _____

Homework: Study for your first Quiz

Warm Up:

Algebra 1: 1.5a Modeling with Expressions (textbook section 2.1)

DOK 2: Model

You will create expressions to model real-world scenarios

Algebraic Expression	
A mathematical phrase that contains operations, numbers, and variables.	$2x - 4y + 9$

a) The **TERMS** of an expression are the parts that are being added. List the terms in   _____
the expression:

b) A **VARIABLE** is a letter that represents an unknown number. List the variables in the   _____
expression:

c) A **COEFFICIENT** is the numerical factor of a variable term. List the coefficients in the   _____
expression:

d) A **CONSTANT** is a number on its own. List the constant in the expression: _____

Reflect: Sydney identified the terms of the expression $9a + 4b - 18$ as
$9a, 4b \; and \; 18$. Explain her error.

1) Tickets to an amusement park are $60 for adults and $30 for children. If a is the number of adults and c is the
number of children, then the cost for a adults and c children is $60a + 30c$

   a. What are the terms in the expression?_____ What are the coefficients?_____

   b. Interpret the meaning of the terms of the expression

   c. Interpret the meaning of the entire expression.

2) The price of a case of juice is $15.00. Fred has a coupon for 20 cents off each bottle in the case. The expression to
find the final cost of the case of juice is $15 - 0.2b$ where b is the number of bottles.

   a. What are the terms in the expression?_____ What are the coefficients?_____

   b. Interpret the meaning of the terms of the expression

   c. Interpret the meaning of the entire expression.

3) Jill is buying ink jet paper and laser jet paper for her business. She buys 9 more packages of ink jet paper than p packages of laser jet paper. Ink jet paper costs $6.95 per package and laser jet paper costs $8 per package. The expression $8p + 6.95(p + 9)$ models this scenario

   a. What does the term $8p$ represent? What does its coefficient represent?

   b. What does the term $6.95(p + 9)$ represent? What do the factors 6.95 and $(p + 9)$ represent?

   c. Interpret the meaning of the entire expression.

Modeling with Expressions

We follow the pattern "Quantity—*Operation*—Quantity" when modeling a real-world situation. The table shows some words and phrases associated with the four basic arithmetic *operations*.

Addition	the sum of, added to, plus, more than, increased by, total, altogether, and
Subtraction	less than, minus, subtracted from, the difference of, take away, taken from, reduced by
Multiplication	times, multiplied by, the product of, percent of, each, per
Division	divided by, division of, quotient of, divided into, ratio of

Quantity   *Quantity*

Operation

4) The price p of an item plus 6% sales tax

Quantity   *Quantity*

Operation

5) The cost of 3 identical items with a 6% sales tax

6) The number of gallons of water in a tank, that already has 300 gallons in it, after being filled at 35 liters per minute for m minutes

7) The cost of n tickets that are $40 each plus a one-time service fee of $3.50.

Name: _____

Warm Up:

Algebra 1: 1.5b Creating and Solving Equations (textbook section 2.2)

DOK3: Model

You will create equations to model and solve real-world scenarios

1) Cory and his friend Walter go to a movie. Each of their tickets costs the same amount, and they share a frozen yogurt that costs $5.50. The total amount they spend is $19.90. How can you write and solve an equation that describes the situation?

   a. ***Identify the important information.***

   The word _____tells you that the relationship describes an equation. The word total tells you that the

   operation involved in the relationship is _____. What numerical information do you

   have? _____ _____ What is

   the unknown quantity? _____

   b. ***Write a verbal description.***

   Choose a variable. Use c for _____.   The verbal description is:

   c. To write an equation, write a number or expression for each quantity and insert an equal sign in the appropriate place. An equation is:

   d. Solve the equation

   e. Interpret your answer:

   f. Reflect: Could you write a different but equivalent equation to model the situation?

NOTES   Name: _____

2) Aaron and Brianna are bowling. Brianna's score is twice the difference of Aaron's score and 5. The sum of their scores is 320. Find each student's bowling score.

a. Choose a variable for the unknown quantity: _____.

b. Write a verbal description of the basic situation:

	_____ Operation		=	

c. To write an equation, write an expression for each quantity and insert an equal sign in the appropriate place. An equation is:

d. Solve the equation and interpret you answer

3) Mari, Carlos, and Amanda collect stamps. Carlos has five more stamps than Mari, and Amanda has three times as many stamps as Carlos. Altogether, they have 100 stamps. Find the number of stamps each person has.

	_____ Operation		_____ Operation		=	
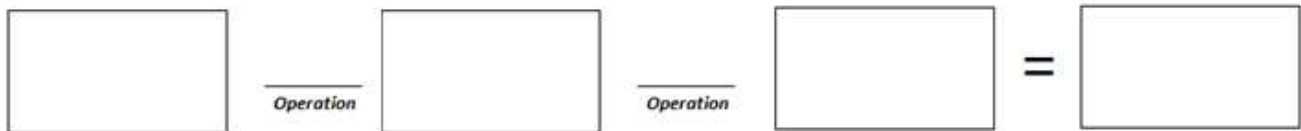
4) A rectangular garden is fenced on all sides with 256 feet of fencing. The garden is 8 feet longer than it is wide.

a. Write three different equations that model the perimeter of the garden and solve.

$(w + 8)$ feet

w feet
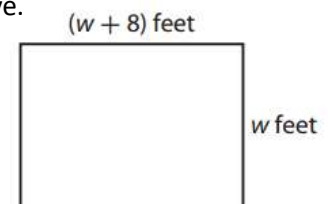
Warm Up:

Algebra 1: 1.6 Solving Equations with Variables on Both Sides (textbook section 2.2)

DOK 2: Analyze

You will: Use properties of equivalence to solve equations

1) Jeni has a key chain business. The key chains sell for $7 each. To start the business Jeni spent $540 and it costs her an additional $3 to produce each key chain. Let k represent the number of key chains produced.

    a. Write an expression for the key chain business' revenue._____

    b. Write an expression for the key chain business' expenses. _____

    c. The point where a company's revenue (sales) are equal to its expenses (cost) is called the break-even point. Create an equation for Jeni's break-even point.

Break-Even Point

Steps for solving multi-step equations:
1. Distribute to eliminate parenthesis
2. Combine like terms on the SAME side of the equals
3. If variable on both sides, move one to the other side to combine them (add or subtract)
4. Move constant (add or subtract) *
5. Move coefficient (multiply or divide) *   *If a fraction is involved, you may have to
                                                              do step 5 then step 4*

    d. Now let's solve the equation from c: e. Interpret your answer.

Examples: Solve for the variable.

2) $3x + 4 = 8x - 16$ 3) $2(6b + 8) = 4 + 6b$

Name: _____

Try it out!

a)   b)

c) A company spends $1500 per day for factory expenses, plus $8 to make each jack-o-lantern. If they sell them for $12 each, how many do they need to sell a day to break even?