Name: _____

Algebra Ch. 3

Algebra 3-1: Models and Properties of Addition

Warm-Up

Answer the following questions. Use past notes or your book if you need to.

1. Give an example of the commutative property of multiplication.   _____

2. Give an example of the associative property of multiplication.   _____

Commutative Property of Addition

When _____ it is legal to _____.

Example: _____

Associative Property of Addition

When _____ it is legal to _____ and deals with _____.

Example: _____

Adding Negative Numbers

Adding –x is the same as _____ x.

Example: 8 + (-2) is the same as _____.

Example Problems

1. Simplify mentally. Write the order in which you simplified.
        198 + 47 + 2   _____

2. Below are steps to simplify (26 + y) + -6. Write down the property shown in each step.

(26 + y) + -6   Given

-6 + (26 + y)   _____

(-6 + 26) + y   _____

20 + y   _____

3. Without a calculator, simplify (-5 + x) + -10.   _____

4. During a drought, the level of the creek dropped 18 inches. After a storm, it rose 2 inches. Later, the level dropped 4 inches.

a. Write an **equation** that represents the net change, C.   _____

b. Use a number line to check your answer.

Assignment: 3-1 #' s 6 – 30, skip 25

Algebra 3-2: More Properties of Addition

Warm-Up

Answer the following questions. Use past notes or your book if you need to.

1. Below are steps to simplify (59 + x) + -10. Write down the property shown in each step.

(59 + x) + -10 Given

-10 + (59 + x) _____

(-10 + 59) + x _____

49 + x   _____

2. The price of denim was $4.66. The price rose *d* dollars, then it dropped 49 cents, and then it rose 18 cents. Write an addition expression that represents the current price of denim. _____

Additive Identity Property

When we add _____ to any number, the value _____.

Example: _____

Property of Opposites

The opposite of a _____ number is a _____ number.

The opposite of a _____ number is a _____ number.

Therefore when we add a number and its opposite it equals _____.

Example: _____

Opposite of Opposite Property

-(-x) = _____   Example: _____

Solving Equations x + a = b

To solve an equation in the form x + a = b, you can either _____ a or _____ -a from both sides.

Example: Solve. Show your steps.   x + 45 = 56

Example Problems

1. Solve. Show your steps.
            143 + y = 180   _____

2. Write and solve the equation to answer the question.
        After receiving orders from Captain Steve, a submarine rose 120 feet to 40 feet below sea level. At what level was the submarine before Captain Steve's orders?
        Equation:

        Steps:

        Solution: _____

3. Simplify. −(-8) + 12 _____

Assignment: 3-2 #' s 3-9, 13-15, 18-20, 22-27

Algebra 3-3: The Coordinate Plane

Warm-Up

Solve. Show your steps. Check.

1. -3x = 15   2. -4 + m = 16   3. 6 − n = 15   4. t − 4 = -3

A **plane** is a _____ surface that stretches _____ in all directions. The **coordinate plane** looks like _____.
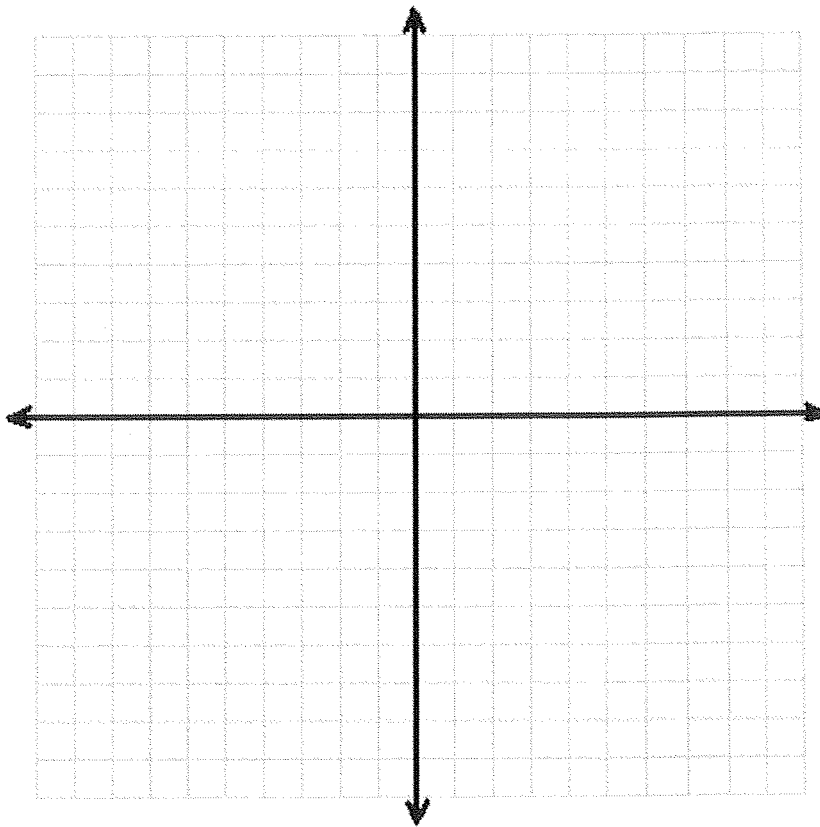
Label:

x-axis

y-axis

Origin

4 Quadrants

In order to locate a point on the _____ _____, we need a _____ and a _____ coordinate. When we **write coordinates**, we put the _____ coordinate first, then a _____ and lastly, the _____ coordinate. We always put the coordinates inside _____.

Example:

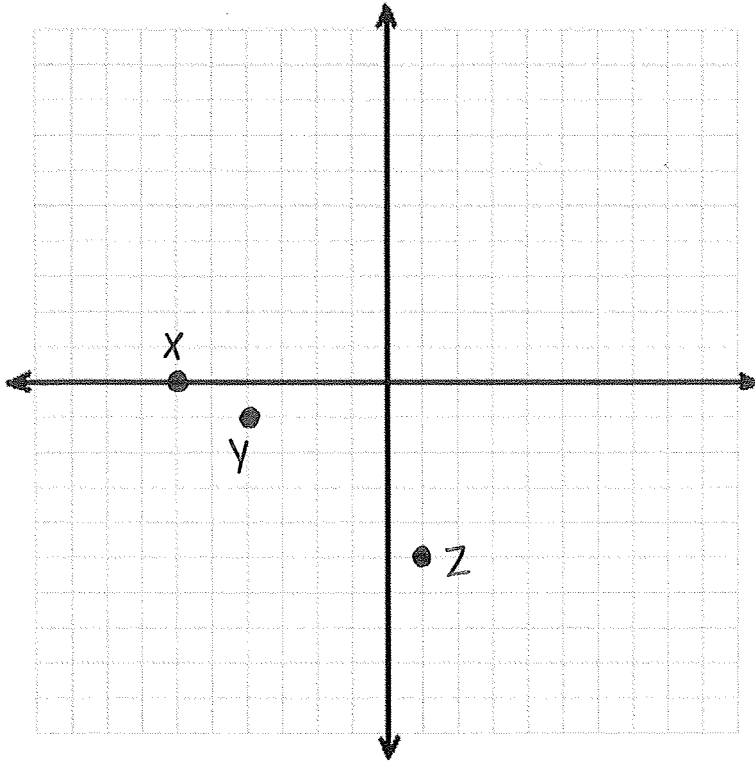| **Plot the following points.** | A (-2, 4) | B (0, -2) | C (3, 5) |

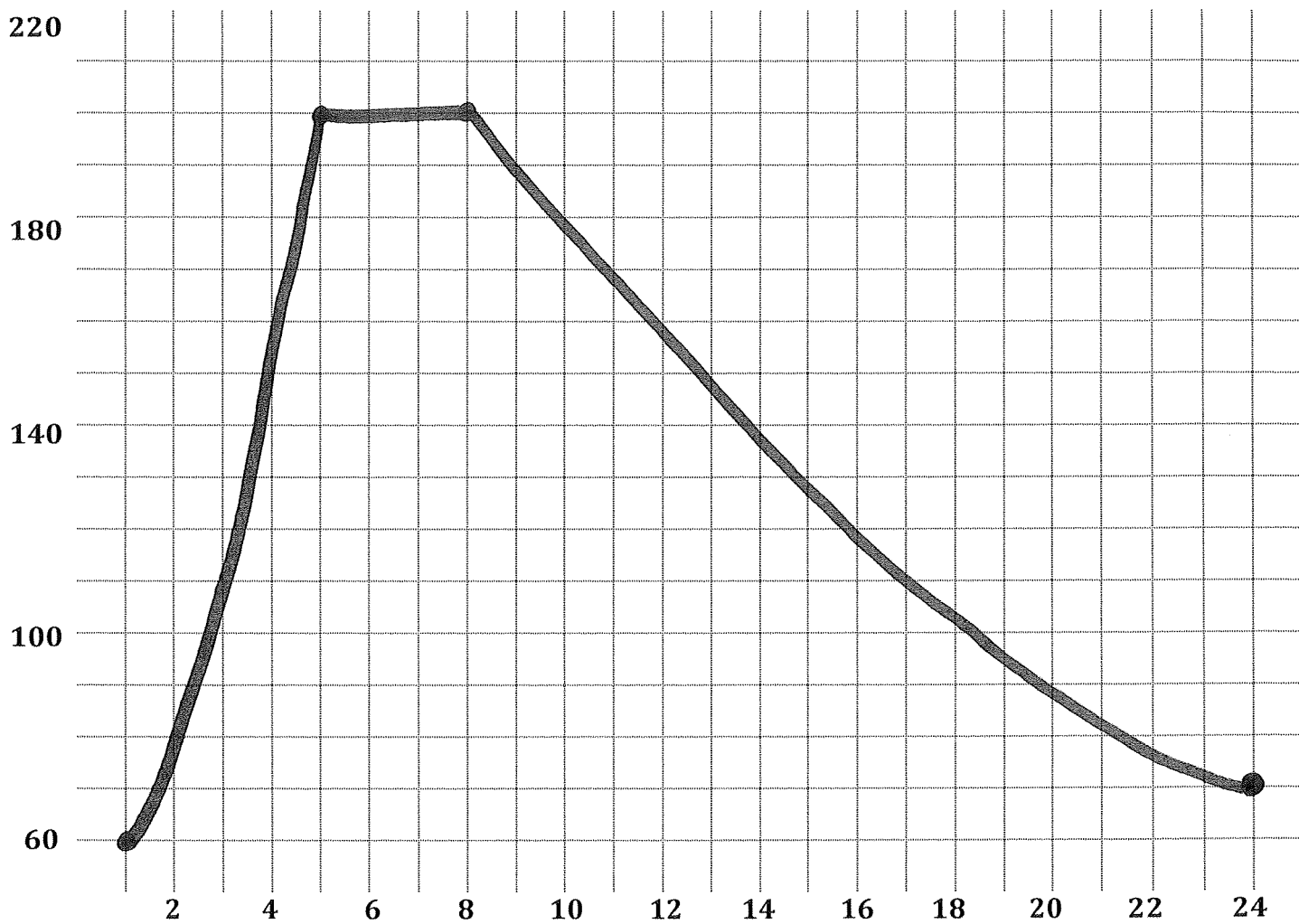| **Name the coordinates.** | X _____ | Y _____ | Z _____ |

A **scatterplot** is a type of graph that _____.

The graph below shows the temperature (in degrees Fahrenheit) of water in a pot on a stove over time (in minutes).

1. Label the axes.
2. Write a story (3 sentences) that explains the graph. Be sure to mention times and temperatures of important points on the graph.
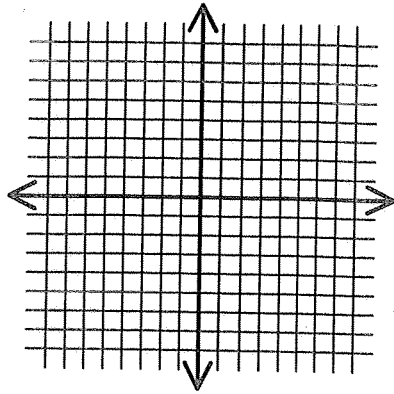
Algebra 3-4: 2-D Slides

Plot each point.

1. A (2, 5)

2. B (0, 4)

3. C (-2, 0)

Add.

1. 5 + (-8) _____

2. - 4 + - 3 _____

3. -6 + 9 _____

| Vocab	Definition	Example
Translation		
2-D Slide		
Preimage		
Image		

Examples

1. Slide the point (5, -2) up 3 units. _____

2. Slide the point (5, -2) left 7 units. _____

3. Slide the point (x, y) up 3 units. _____

4. Slide the point (x, y) left 7 units. _____

5. ΔXYZ has coordinates, X (3, 2), Y (1, -2), and Z (-1, 3). On the coordinate plane, slide the entire triangle 3 units to the right and 4 down. Name the coordinates of X'Y'Z'.
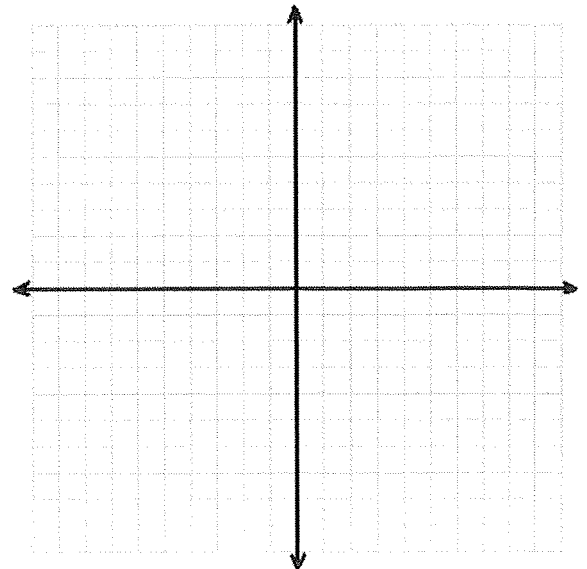
6. $\triangle ABC$ has coordinates, A (3, 2), B (1, -2), and C (-1, 3).
Slide the entire triangle r units to the left and d units up.
Name the coordinates of A'B'C'.

_____   _____   _____

7. Explain the translation that occurred in the plane below.

_____
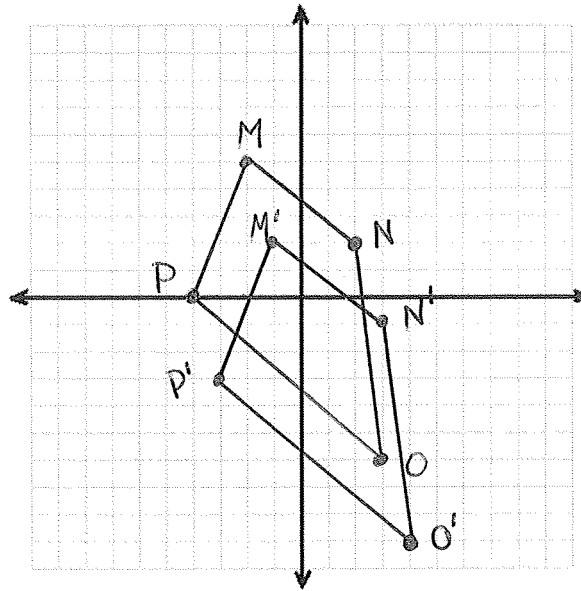
8. Translate $\triangle MNO$ under the given translation. $(x, y) \rightarrow (x - 3, y + 4)$
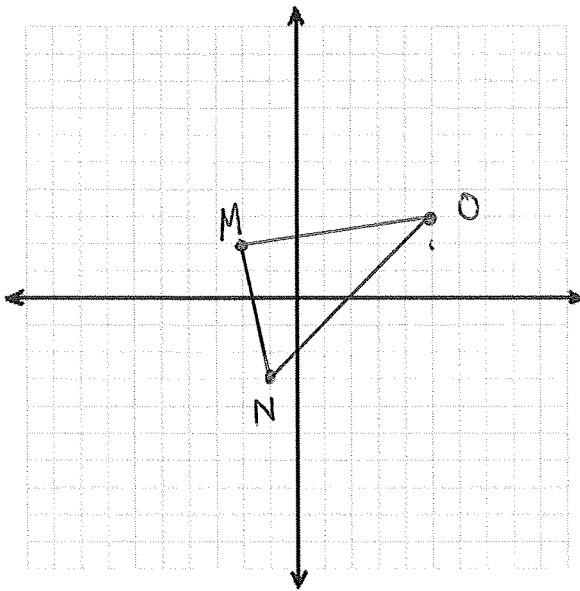
Assignment: 3-4 #'s 1-13, 15, 17-19, 22-26, 5 graphs total
Do # 7 & 8 on the same plane and # 11 & 12 on the same plane.

Algebra 3-5: Solving ax + b = c

Warm-Up

1. $\triangle ABC$ is translated to $\triangle A'B'C'$ by sliding 3 units down and 2 units to the left. The coordinates of $\triangle ABC$ are A (1, 0), B (2, -3), and C (-4, -1). What are the coordinates of $\triangle A'B'C'$?

_____   _____   _____

2. $\triangle LMN$ is translated 3 units down and 2 units left. What are the coordinates of $\triangle L'M'N'$, if L is (x, y), M is (s, t), and N is (q, r)?

_____   _____   _____

Goal: Our goal is to _____.

We will ALWAYS have a correct answer because we can _____ our answer by

_____.

When solving 2 step equations ask yourself the following questions...

1. Can you combine anything on the left-hand side **(LHS)?** Do it!
2. Can you combine anything on the right-hand side **(RHS)?** Do it!
3. What side is the **variable** on?
4. Is there a number being **added/subtracted** to THAT side? Get rid of it! Do the opposite.
5. Is the variable being **multiplied** by anything? Get rid of it! Do the opposite.
6. _____ your answer.
7. In order to easily see your answer, _____ it.

Examples
1. $3x - 3 = 15$ 2. $7e + 2 = 3 + 6$ 3. $2v - (-2) = 8$

4. $15 = 6 - 3r$

5. $-3k + 5 = 3.5$

6. $\frac{1}{2}x - 5 = 23$

Assignment: 3-5 #'s 1-18, 23, 24, 26-29, skip 9, 15, 16

Algebra 3-6: The Distributive Property & Adding Like Terms

Warm-Up

Solve. Show steps. Check.

1. $15 = 3 - 5w$

2. $4 - a = 12$

3. $2/3x + (-4) = 6$

Vocab	Definition	Example
Coefficient		
Like Terms		
Distributive Property		

Examples

Simplify. Lowest terms possible.

1. $8s + -5s$

2. $(3s + d + 6) + (2d + s)$

3. $4n^2 + (-3n^2) + 4$

4. $4y + (-y) + 3$

5. $3m^2 + 5m - 8m^2$

6. $10r^3 - 2r + r^3 + 6r$

7. $5 - x + 6x + 3x^2$

8. $2y^2 + 5y^2 + y^2 - 8y^2$

9. $3x + 2x^2$

Solve. Show steps. Check.

10. $-3x + 5x = -12$

11. $6 + -2x + (-9x) = 39$

12. $-2x + 3x - 4 = 1$

13. $2y + 10 - 3y = 14$

Assignment: 3-6 #'s 3-20, 24, 30, skip 17

Algebra 3-7: The Distributive Property & Removing Parentheses

Warm-Up

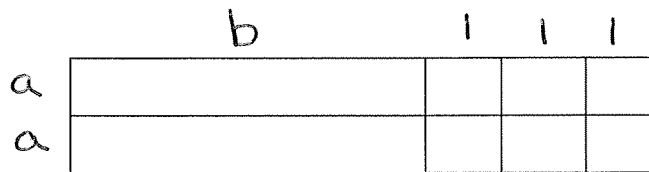**Simplify.**

1. $-3r + 4x^2 - r - 2x^2$

2. $3xy^2 + 2x^2y - xy^2$

Solve. Show steps. Check.

3. $3m - 2m = 10$

4. $4x - 3 + 3x = 4$

Vocab	Definition	Example
Distributive Property		

When using the distributive property, we _____ the outside number by the _____ numbers. We always separate terms with either a _____ or _____ sign.

Examples

Simplify.

1. $4(3x + 5)$

2. $x(5x - 3)$

3. $2(3 - z)$

4. $-4(y + 3 + x)$

5. $-2z(z - 3)$

6. $-3n(m + 3 - p)$

Solve. Show steps. Check.

10. $-3(2x - 1) = 15$

Calculate mentally.

11. 3 shirts at $9.98 each

12. 4 times $25.02

Assignment: 3-7 #'s 2-17, 20-28

Algebra 3-9: Adding Algebraic Fractions

Warm-Up

1. How can you use the distributive property to compute mentally the price of 6 pairs of pants if each pair costs $ 19.95? _____

_____

Simplify.

2. $2xy + 3x + 7xy$ _____

3. $-3j + (-2hj) + 5hj$ _____

Vocab	Definition	Example
Numerator		
Denominator		
Common Denominator		

Adding Fractions

1. If there is not a _____ _____, get one.

2. Add the _____ or the numbers on top.

3. The number on the bottom _____.

4. Always _____.

Examples

Simplify.

1. $\dfrac{5}{4} + \dfrac{1}{5}$

2. $\dfrac{a}{3} + \dfrac{2a}{5}$

3. $\dfrac{3x}{9} + \dfrac{x^2}{3} + \dfrac{5x}{3}$

4. $\dfrac{2}{3y} + -\dfrac{5}{3y} + \dfrac{7}{3y}$

5. $8k + \dfrac{2k}{3}$

6. $\dfrac{4r + -2}{3xy} + \dfrac{9r + 3}{3xy}$

7. $-\dfrac{2}{3}t + \dfrac{2}{5}t$

Assignment: 3-9 #'s 1-28, skip 21 & 23

Algebra 3-10: Solving ax + b < c

Warm-Up

Solve and check.

1. -7x + 6x = 16

2. -2 (x + 5) = 4

Reminders

- When multiplying or dividing by a _____ number, we have to _____.

- On a number line _____ and _____ use an _____ and _____ and _____ use a closed circle or _____.

Examples

Solve and graph.

1. -4x + 6x > 16

2. -11n + (-16) < 17

← —————————————→   ← —————————————→

3. -4h + 9 < 1

4. 4r + 2 < 10

← —————————————→   ← —————————————→

5. -2 (x + 5) > 4

6.   5 + 2f ≥ 20 + (-3)

← —————————————→   ← —————————————→

7.   3 ≤ 2 x + -3
            3

8. 5(2y +4) > -10

← —————————————→   ← —————————————→

Assignment: 3-10 #' s 2, 5-17, 19-21, 24, 25