

Name: \_\_\_\_\_

## Algebra Ch. 7 Slopes & Lines

### Algebra 7-1: Rate of Change

| Vocab          | Definition | Example |
|----------------|------------|---------|
| Rate of Change |            |         |

Fill in the blanks to give the rate of change for each situation.

1. A plant grew 30 inches in 10 weeks. Rate of Change = \_\_\_\_\_ per \_\_\_\_\_
2. George lost 30 pounds in 12 weeks. Rate of Change = \_\_\_\_\_ per \_\_\_\_\_
3. In 5 years, the school bought 20 SmartBoards. Rate of Change = \_\_\_\_\_ per \_\_\_\_\_
4. 2 inches of rain fell in 8 hours. Rate of Change = \_\_\_\_\_ per \_\_\_\_\_

Answer the following questions based on the following situation.

When Jordan was 10 years old, he was 4' 3".

When Jordan was 12 years old, he was 4' 7".

When Jordan was 16 years old, he was 5' 7".

When Jordan was 18 years old, he was 5' 9".

5. What is Jordan's average change in height per year from...

a. 10 to 12 years old? \_\_\_\_\_

b. 12 to 16 years old? \_\_\_\_\_

c. 16 to 18 years old? \_\_\_\_\_

6. When did Jordan grow...

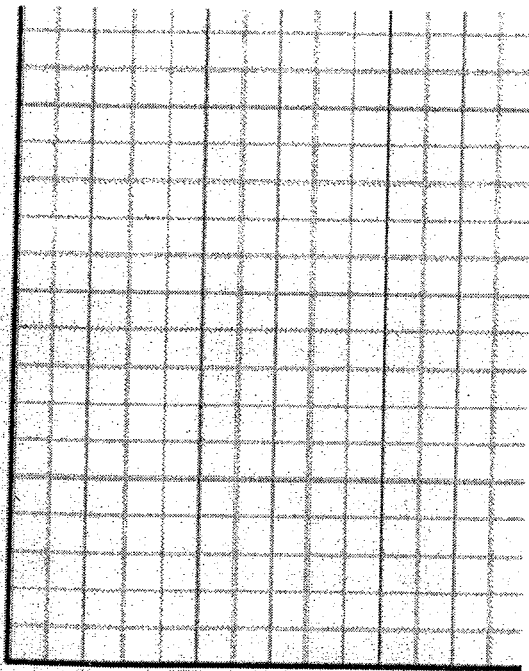
a. the fastest? \_\_\_\_\_

b. the slowest? \_\_\_\_\_

The data below represents how much money Sue had in her piggy bank for the past 10 years. Use the table to answer the following questions.

|       |      |       |       |       |       |     |
|-------|------|-------|-------|-------|-------|-----|
| Years | 0    | 3     | 5     | 7     | 8     | 10  |
| Money | \$20 | \$100 | \$100 | \$140 | \$140 | \$0 |

7. Graph the data.
8. Between what years is the rate of change ...
  - a. positive? \_\_\_\_\_
  - b. negative? \_\_\_\_\_
  - c. zero? \_\_\_\_\_
9. Find the rate of change between...
  - a. the first 3 years. \_\_\_\_\_
  - b. the 3<sup>rd</sup> and 5<sup>th</sup> year. \_\_\_\_\_
  - c. the 9<sup>th</sup> and 10<sup>th</sup> year. \_\_\_\_\_
10. Between which consecutive years was the rate of change the greatest? \_\_\_\_\_
11. What is the average annual rate of change between year 1 and 10? \_\_\_\_\_

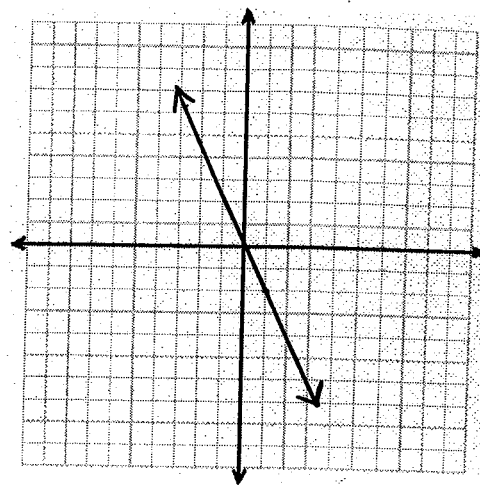
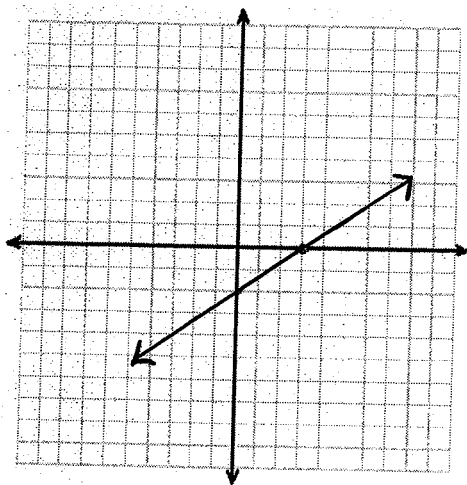


# Algebra Slope Day 1

## Warm-Up

### Directions

1. Find 2 points on the line that have whole numbers as their coordinates.
2. Label your points A & B.
3. Draw a path from point A to point B.



1. How did you get from point A to point B?

2. How did you get from point A to point B?

### iPad Activity: Sketchpad Explorer

Use the tabs at the bottom to explore and learn about slope.

**Fill in the blank.**

1. Touch the *Defining Slope* tab on the bottom. Touch *Show Triangle* and the other 2 buttons.

In order to find slope, create a right \_\_\_\_\_ that connects the two \_\_\_\_\_. The slope is the \_\_\_\_\_ of \_\_\_\_\_ to \_\_\_\_\_.

2. Touch the *Measuring Slope* tab. Drag the points on the line.

Can you use any points on the line to find the slope of that line? \_\_\_\_\_

Does the slope change when you use different points on the same line? \_\_\_\_\_

3. Drag any of the points on the line. Notice the slope changes.

What type of line has a slope of 0? \_\_\_\_\_

4. In your own words, explain what slope is. Use an example to support your answer.

---

5. **BONUS: Touch the Two Lines Tab. Make the lines parallel to each other.**

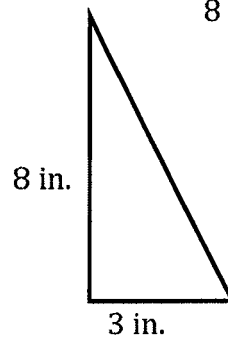
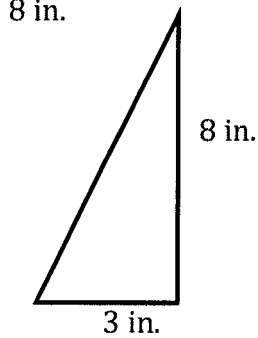
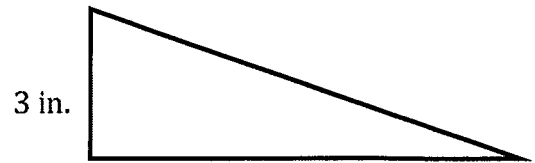
What do you notice about the slope or rate of change? \_\_\_\_\_

6. **BONUS: Make the lines perpendicular to each other (create a 90 degree angle).**

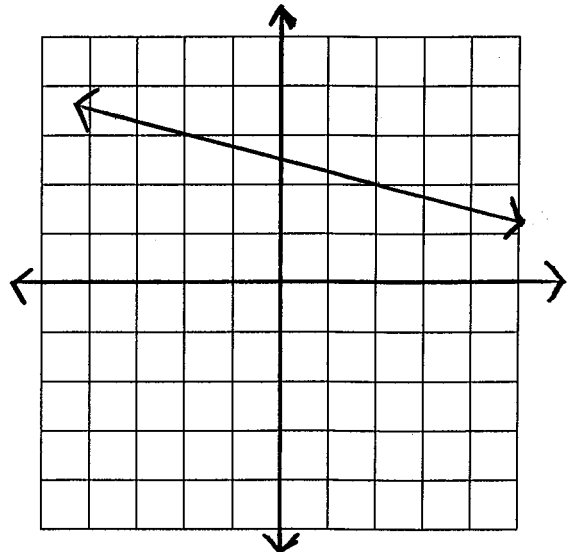
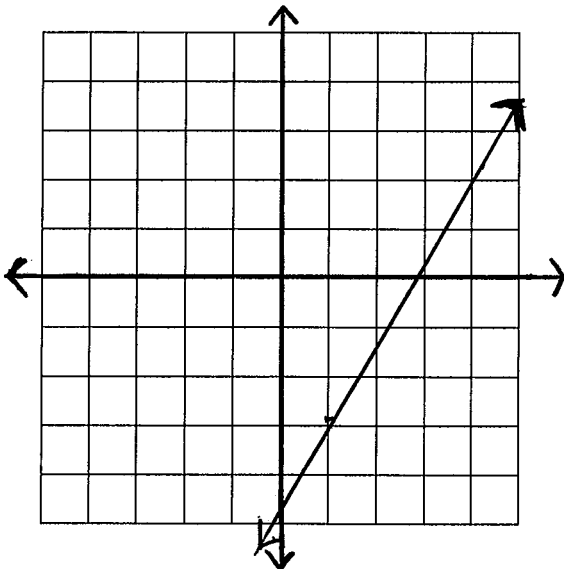
What do you notice about the slope or rate of change? \_\_\_\_\_

**Examples**

**Find the slope of each ramp.**



**Find the slope of each line. Find 2 points first**



# Algebra Slope Day 2

## Warm Up

Simplify numbers 1-4.

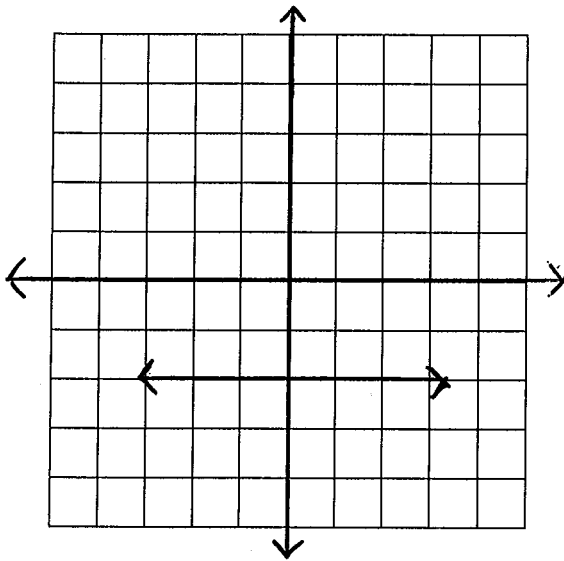
1.  $\frac{9-5}{8-3}$

2.  $\frac{5-9}{3-8}$

3.  $\frac{6-(-8)}{-2-(-4)}$

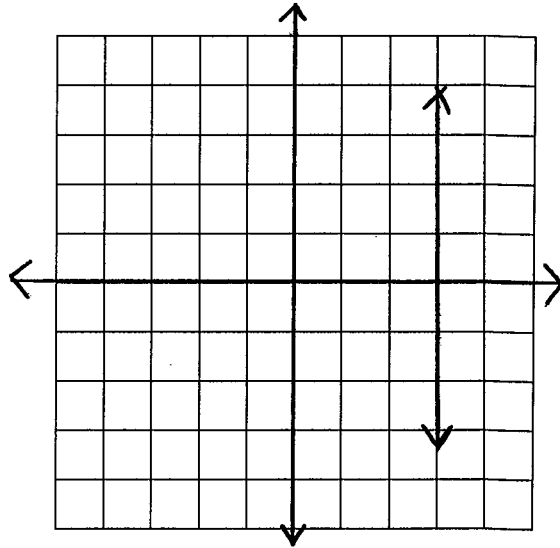
4.  $\frac{-8-6}{-4-(-2)}$

Find the slope of the lines below.



Slope = \_\_\_\_\_

**Slope of Vertical Lines =**



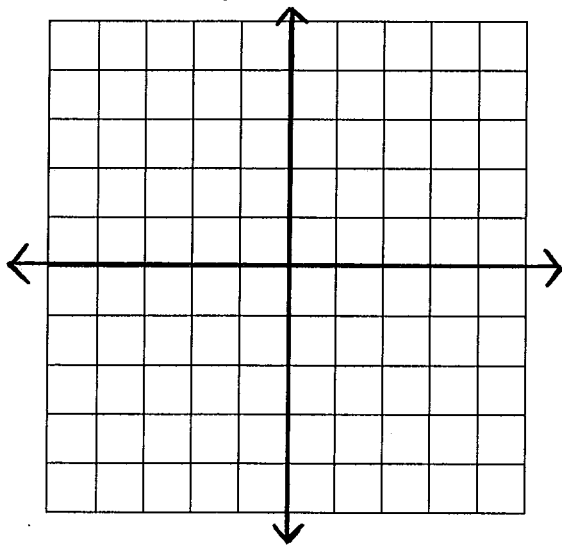
Slope = \_\_\_\_\_

**Slope of Horizontal Lines =**

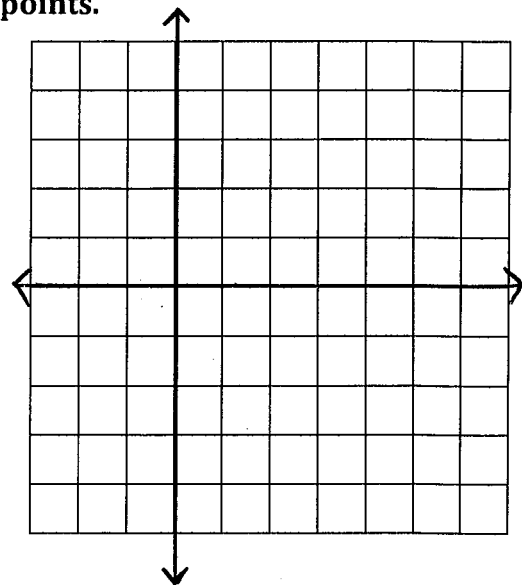
| Vocab          | Definition   | Example |
|----------------|--|---------|
| Slope          | <ul style="list-style-type: none"> <li>• Represented by _____</li> <li>• _____</li> <li>• _____</li> </ul> |         |
| Positive Slope |  |         |
| Negative Slope |  |         |

**Examples**

Find the slope of a line that contains the following points.



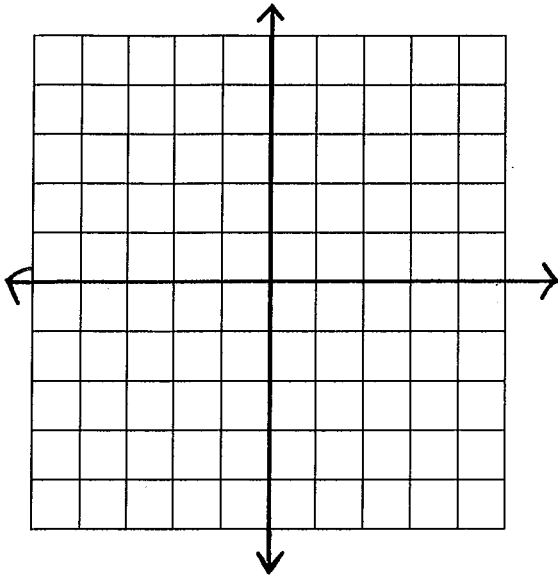
1.  $(3, 4)$  &  $(-2, -3)$  \_\_\_\_\_



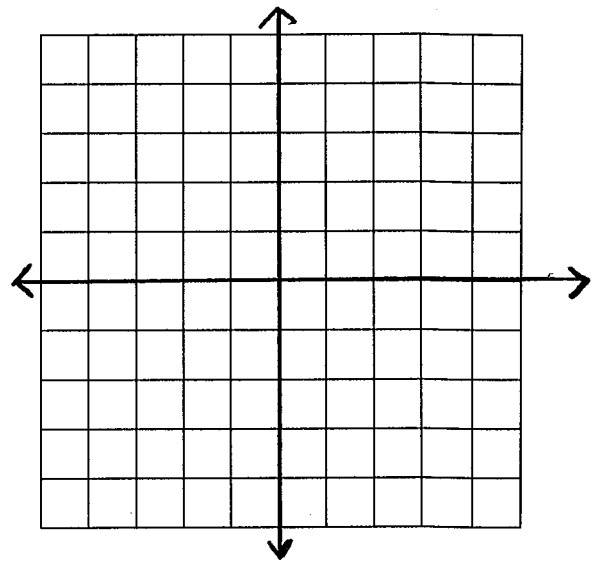
2.  $(-2, 4)$  &  $(6, -3)$  \_\_\_\_\_

For numbers 3-4, graph a line through (2, -1) with a slope of...

3. 4



4.  $(-2/5)$



Find the slope of the line that contains the following points.

5.  $(-2, 6)$  &  $(6, -4)$

6.  $(-2, -3)$  &  $(-5, -5)$

Assignment: 7-2 #'s 1- 21, skip 4

### Algebra Slope Day 3

Putting it ALL together!!

1. What is slope?

---

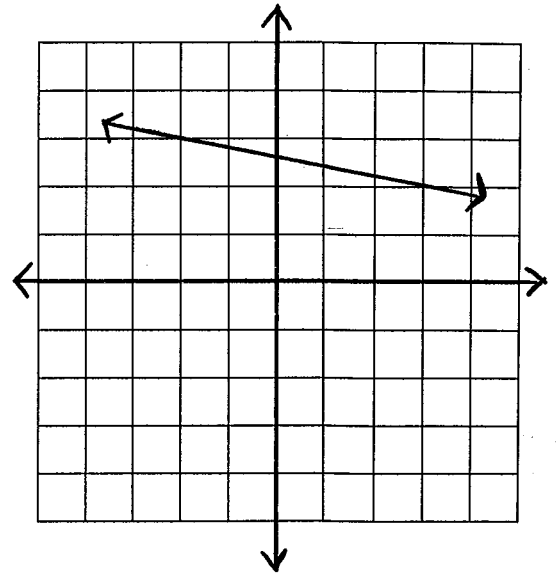
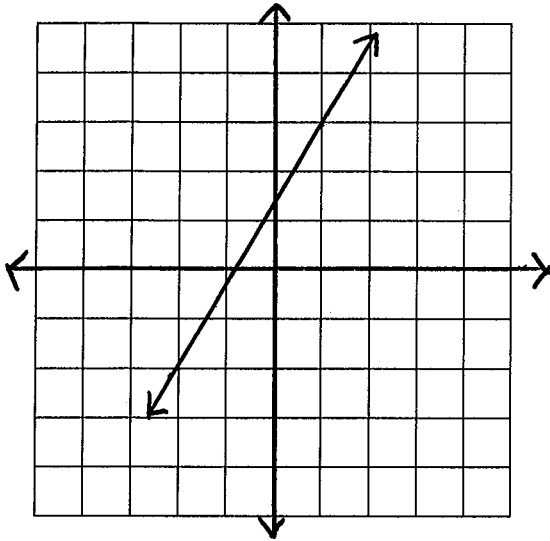
2. What variable represents slope? \_\_\_\_\_

3. If you are given a point and the slope, how do you graph a line through the point with the given slope? Explain in words. \_\_\_\_\_

---

4. If a line has a slope of 3, then for every \_\_\_\_\_ unit(s) to the right, you need to move \_\_\_\_\_ units up/down.

5. If a line has a slope of -4, then for every \_\_\_\_\_ unit(s) to the right, you need to move \_\_\_\_\_ units up/down.
6. If you are given a graph with a line plotted, how do you find the slope of that line? Explain in words. \_\_\_\_\_  
\_\_\_\_\_
7. Find the slope of a line that contains (8, 2) and (-2, -2). \_\_\_\_\_
8. Find the slopes of the lines below.



9. A vertical line has a slope of \_\_\_\_\_.
10. A horizontal line has a slope of \_\_\_\_\_.

**Find 2 points on each line. Then determine the slope.**

11.  $3x + y = 4$

12.  $3x + 2y = 4$



13. Are  $(-2, 1)$ ,  $(1, 1)$ , and  $(3, 0)$  on the same line?

---

---

14. Why can't  $(-3, 3)$ ,  $(-2, 1)$  and  $(-1, 1)$  be on the same line? Explain **without** graphing.

---

---

**Assignment: Slope Day 3 Wkst**

**Rate of Change & Slope Quiz Review**

1. The table below shows the average number of cars (in thousands) produced each month in Mexico.

| Year           | 1987 | 1988 | 1989 | 1990 | 1991 |
|----------------|------|------|------|------|------|
| Cars per month | 19.0 | 29.0 | 37.9 | 51.2 | 61.1 |

a. Find the rate of change in the number of cars produced from 1987 to 1988.

b. Find the rate of change in the number of cars produced from 1988 to 1991.

2. What is the slope of the line through  $(-1, -5)$  and  $(4, 8)$ ?

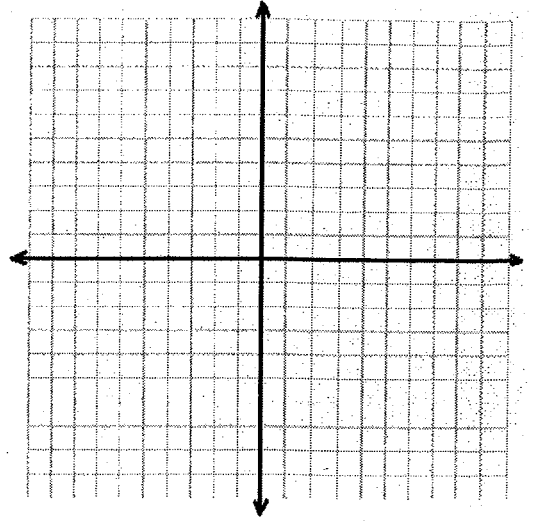
3. What is the slope of the line  $-x + 2y = 6$  ?

4. Do the points  $(1, 9)$ ,  $(-2, 6)$ , and  $(0, 4)$  lie on the same line?  
Justify your answer.

5. Graph the line which passes through  $(3, 2)$  and has a slope of  $-2$ .

6. Draw the graph of a line with a slope of zero.

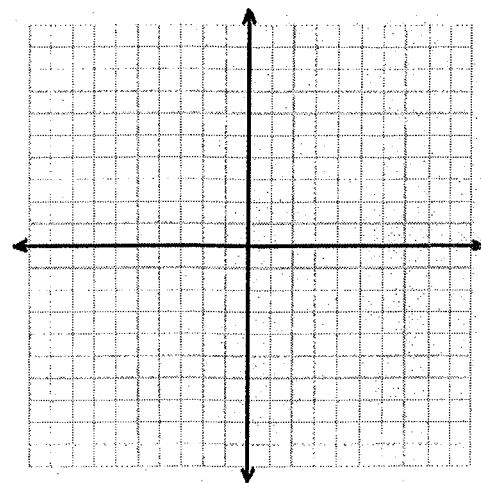
7. Give an equation for a line with an undefined slope.



## Algebra Equations Day 1

### Warm Up

1. You have \$300 in a savings account. You spend \$5 each day for lunch.
  - a. Make a table to show how much money you have in your account (up to 10 days).
  - b. Graph your data.
  - c. How much money will you have in 10 days? \_\_\_\_\_
  - d. How much money will you have in 12 days? \_\_\_\_\_



- e. Write an equation to represent how much money you will have left in your savings account after  $x$ , days.
- f.  
 $x =$  \_\_\_\_\_  
 $y =$  \_\_\_\_\_

## Algebra Equations of Lines Day 1

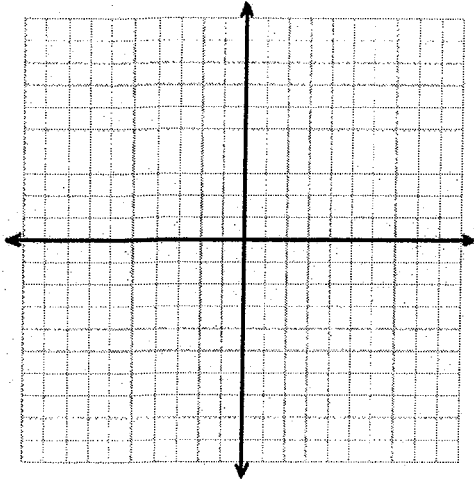
When equations look like this (see above), it is in \_\_\_\_\_ form.

The number in front of  $x$  is the \_\_\_\_\_. The number NOT in front of the  $x$  is the \_\_\_\_\_. When graphing, start at the \_\_\_\_\_ and then use the \_\_\_\_\_ to find the next point.

### Examples

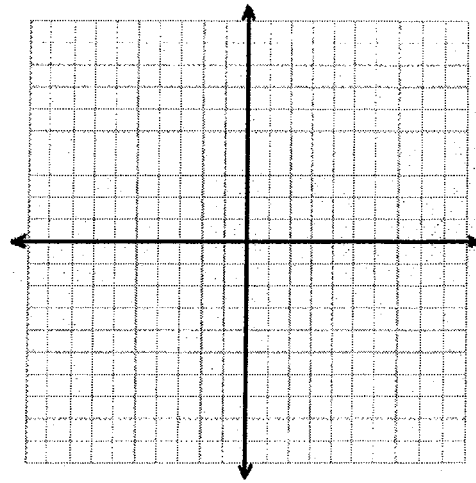
For numbers 1-2, graph each line with the given information. Then write the equation for the line.

1. Slope = 4  
y-intercept = 1



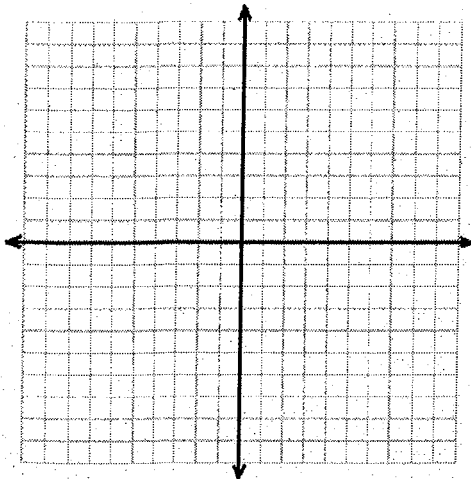
Equation \_\_\_\_\_

2. Slope = -3  
y-intercept = 0

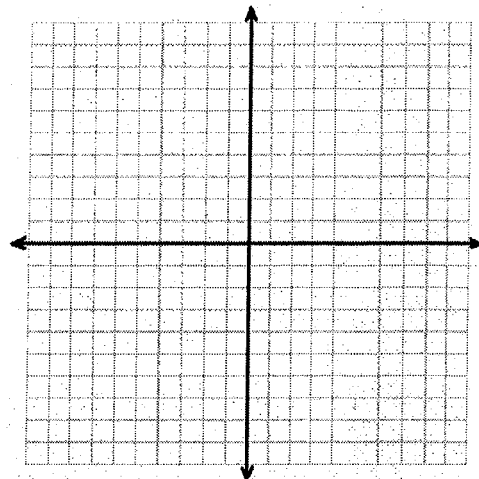


Equation \_\_\_\_\_

3. Graph the line  $y = 3x + 2$ .



4. Graph the line  $y = x - 2$ .



5. Rewrite each equation for the line in slope-intercept form. Then find the slope and y-intercept.

a.  $x + y = 4$       slope = \_\_\_\_\_      y-intercept = \_\_\_\_\_

b.  $3x + 2y = 10$       slope = \_\_\_\_\_      y-intercept = \_\_\_\_\_

6. The price of a cheese pizza is \$4.50 with an extra charge of \$.50 for each additional topping. If this situation were graphed with  $x$  = the number of toppings and  $y$  = total price, what would be...

a. y - intercept? \_\_\_\_\_

b. slope? \_\_\_\_\_

c. equation? \_\_\_\_\_

**Assignment: 7-4 #'s 1-19, skip 11 & 12**

**Algebra Equations of Lines Day 2**  
**iPad Activity**

**Work Space:**

**Assignment: Slope Intercept Review Wkst**

# Algebra Equations of Lines Day 3

## Warm Up

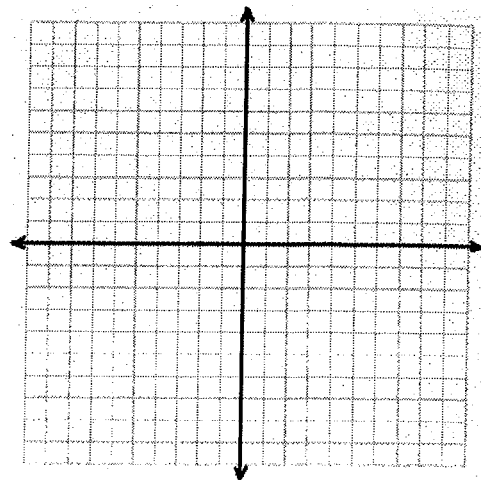
1. You have \$5 and you earn \$2 everyday.

a. How much money will you have in 10 days? \_\_\_\_\_

b. How much money will you have in 25 days? \_\_\_\_\_

c. How much money will you have in  $d$  days? \_\_\_\_\_

d. Write an equation to represent the situation. \_\_\_\_\_



When equations are in \_\_\_\_\_ form, they look like  $y = \underline{\hspace{1cm}}x + \underline{\hspace{1cm}}$ .  
\_\_\_\_\_ represents the slope and \_\_\_\_\_ represents the \_\_\_\_\_ - intercept.

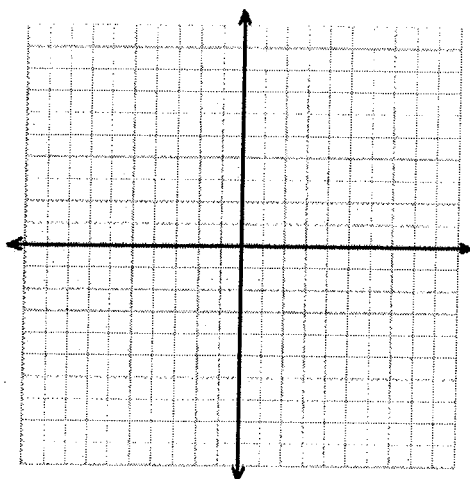
For example in the equation,  $y = 5x + 3$ , the slope is \_\_\_\_\_ and the \_\_\_\_\_ - intercept is \_\_\_\_\_.

## Algebra Equations of Lines Day 3

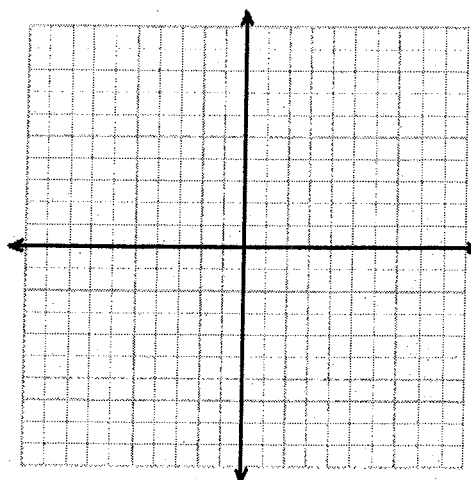
### Examples

For numbers 1-4, graph each line with the given equation.

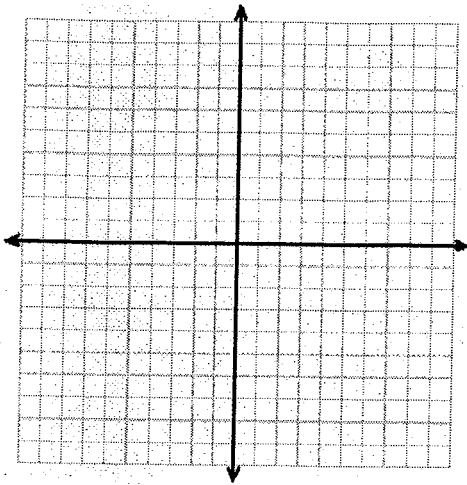
1.  $y = 4x + 1$



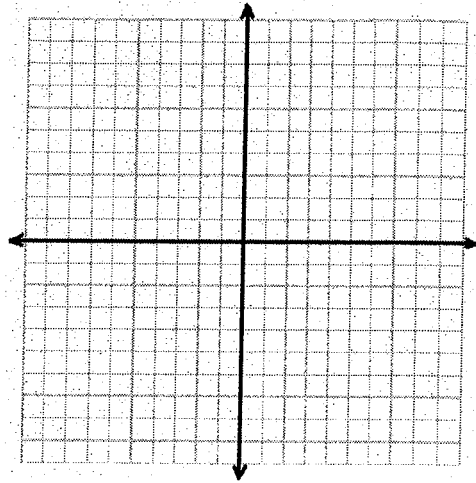
2.  $y = \frac{-1}{2}x + 3$



3.  $y = \frac{1}{3}x - 5$



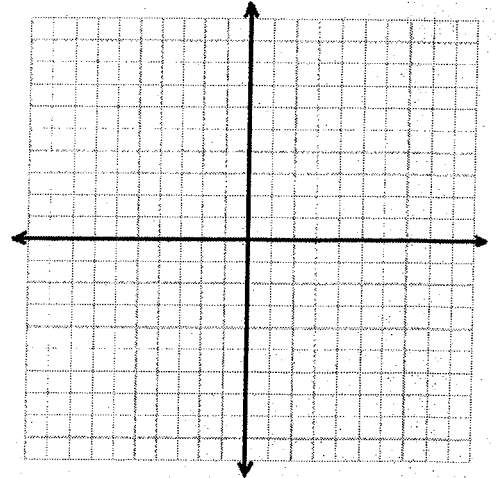
4.  $y = 6x$



4. Graph the line with a slope of 2, that goes through the point (1, -4).

**Steps:** Plot the \_\_\_\_\_ first. Then use the \_\_\_\_\_ to find the next point.

a. What is the equation for this line? \_\_\_\_\_



b. What is a shortcut to find the equation (without graphing)?

**Steps:** 1. Start with Slope-Intercept form which is \_\_\_\_\_.

2. Substitute the slope in for \_\_\_\_\_ and the coordinates in for \_\_\_\_\_ & \_\_\_\_\_.

3. Solve for \_\_\_\_\_.

4. Substitute the 2 essential values \_\_\_\_\_ & \_\_\_\_\_ in for \_\_\_\_\_ & \_\_\_\_\_.

6. Find the equation for the line with a slope of 3, through the point (-2, 5). \_\_\_\_\_

7. Find the equation for the line with a slope of  $\frac{2}{5}$ , through the point (10, -1). \_\_\_\_\_

8. Find the equation for the line that goes through the origin (which is \_\_\_\_\_),

and has a slope of  $\frac{-4}{3}$ . \_\_\_\_\_

**Assignment: Equations Day 3 Wkst**

### **Algebra Equations of Lines Day 4**

#### **Warm Up**

1. Explain in words how to find the slope of a line if you know 2 points on the line.

---

---

2. Find the slope of the line through (-1, 5) and (3, 8). \_\_\_\_\_

3. Write an equation for the line with a slope of -8 and a y-intercept of 3. \_\_\_\_\_



For numbers 4 & 5, write an equation for each line with the given information.

4. slope = 5 through the point (2, -1)

\_\_\_\_\_

5. slope = -3 through the point (-6, 0)

\_\_\_\_\_

### Algebra Equations of Lines Day 4

When we are given two points, we first have to find the \_\_\_\_\_ by \_\_\_\_\_. Then we have to substitute in \_\_\_\_\_ and our \_\_\_\_\_. Then solve for \_\_\_\_\_. Lastly we have to \_\_\_\_\_.

#### Examples

Write an equation for the line that passes through the following points.

1. (-2, 0) and (-1, 2)

2. (-6, -1) and (3, 7)

\_\_\_\_\_

\_\_\_\_\_

3. A piece of pizza with 6 grams of fat has 255 calories. A piece of pizza with 13 grams of fat has 325 calories. Write an equation that represents how many calories a slice of pizza has based on how many grams of fat it contains.

\_\_\_\_\_

## Linear Equations Quiz Review

1. Write the equation  $5x + 8y = 20$  in slope-intercept form.
2. Graph the line which goes through  $(3, 2)$  and has a slope of 1.
3. Find the slope and the y-intercept of the line  $3x + 4y = 9$ .
4. Mike has saved \$95. He decides to spend \$7 per week on food. Write an equation giving the amount  $y$  he has left after  $x$  weeks.
5. Write an equation in slope-intercept form for the line with slope -8 and y-intercept -3.
6. Write an equation in slope-intercept form for the line through  $(-3, 5)$  with a slope of 2.
7. Write an equation in slope-intercept form for the line through  $(0, -8)$  with a slope of -7.
8. A line has a slope of -4 and its x-intercept is 6. Find an equation for the line in slope-intercept form.
9. Joe Cool's is having a sale on boards. By the 6<sup>th</sup> day there are 80 boards left. The store **sells** about 15 boards each day. Write an equation for  $y$ , boards remaining in terms of  $x$  days since the sale started.

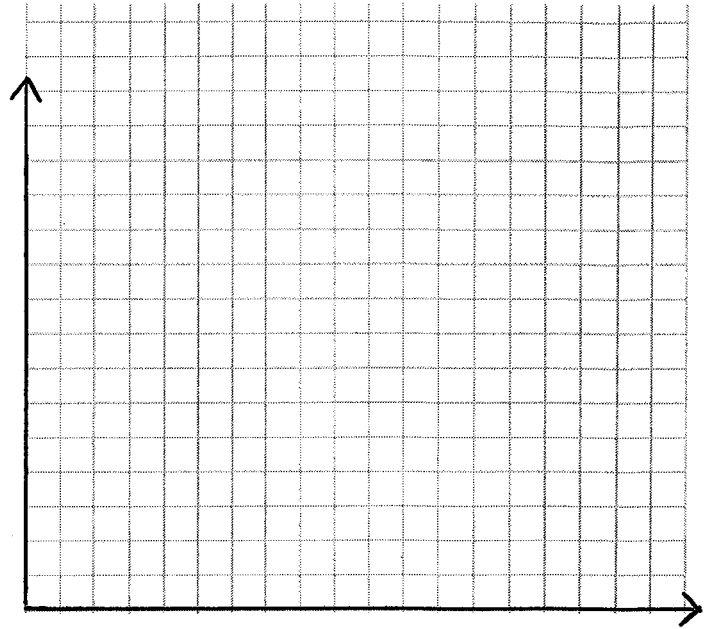
10. Write an equation for the line through  $(-4, 2)$  and  $(1, 4)$ .

11. Write an equation for the line through  $(1, -2)$  and  $(3, 4)$ .

12. Suppose a 5-minute overseas call costs \$5.91 and a 10-minute call costs \$10.86. Write an equation relating time  $x$  and cost  $y$ .

## Algebra 7-7 Warm-Up

1. On the board, write your height in inches and shoe size.
2. Create a scatterplot by plotting the data on the graph below.



## Algebra 7-7 Best Fit Lines

### How to Create an Equation for a Best Fit Line

1. \_\_\_\_\_ the data on a coordinate plane.
2. \_\_\_\_\_ a best fit line.
3. Pick 2 \_\_\_\_\_ **on** that line.
4. Find the \_\_\_\_\_ by \_\_\_\_\_.
5. Write an \_\_\_\_\_.

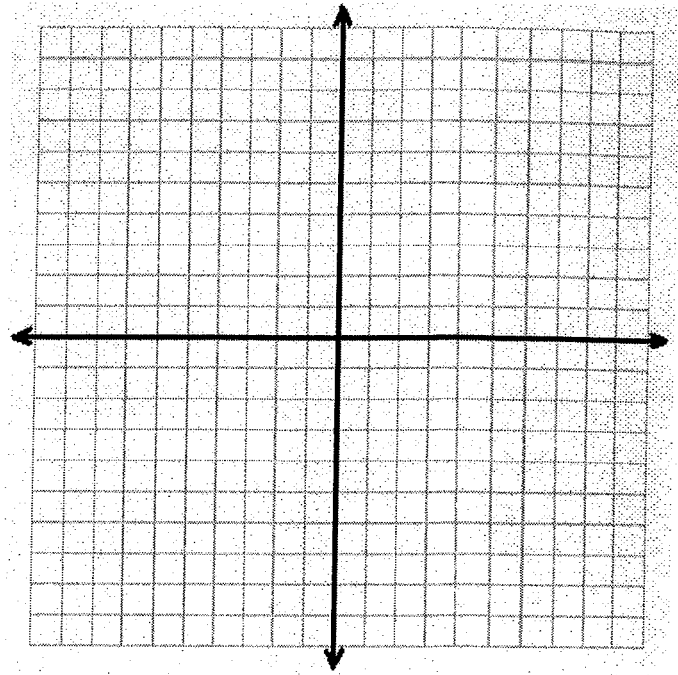
### Examples

1. Draw a best fit line for the data in the warm-up problem.
2. Write an equation that represents that line.
  
3. Predict what shoe size a 7 ft. (84 in.) tall person would wear.

**Assignment:** 7-7 #'s 4, 5, 12-19

## Algebra 7-8 Warm-Up

1. Graph the line  $y = 4$  and label it line a.
2. Graph the line  $x = -3$  and label it line b.
3. Graph the line  $y = 4x - 3$  and label it line c.



## Algebra 7-8: Equations for All Lines-Standard Form

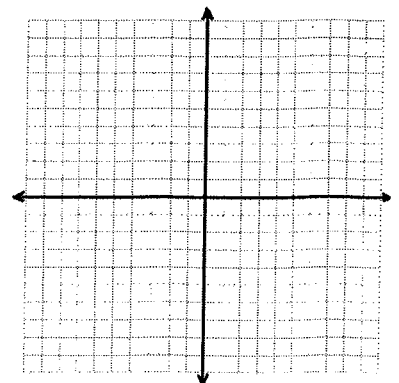
When graphing lines that are in standard form, we first have to change it into \_\_\_\_\_

| Vocab         | Definition | Example |
|---------------|------------|---------|
| Standard Form |            |         |

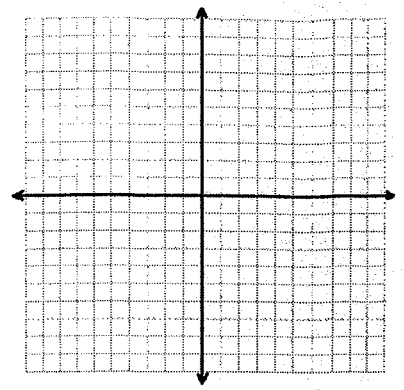
\_\_\_\_\_. From there, we know the \_\_\_\_\_ and the \_\_\_\_ - \_\_\_\_\_. Then we are able to \_\_\_\_\_ by starting at the \_\_\_\_ - \_\_\_\_\_ and using the \_\_\_\_\_ to find the next point.

### Examples

1. Graph  $5x - 2y = -20$



2. Graph  $4x + 2y = 5$



3. Grace has \$36 in five-dollar bills and singles. How many of each kind of bill does she have?

a. Write an equation that describes the situation. \_\_\_\_\_

b. Give 3 solutions. \_\_\_\_\_  
\_\_\_\_\_

4. Rewrite each equation in standard form.

a.  $y = -8x - 3$  \_\_\_\_\_

b.  $y = \frac{2}{3}x + 12$  \_\_\_\_\_

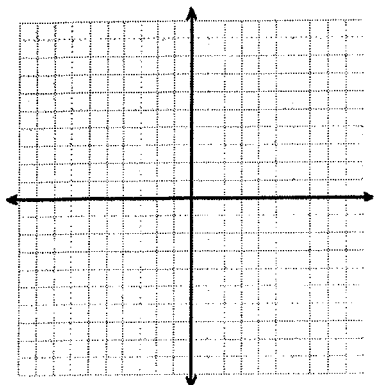
5. Find the x- intercept and the y-intercept for the following equation.  $-10x + 5y = -10$

(Hint: When a line crosses the x-axis the \_\_\_\_\_ value is 0. When a line crosses the y-axis, the \_\_\_\_\_ value is 0.)

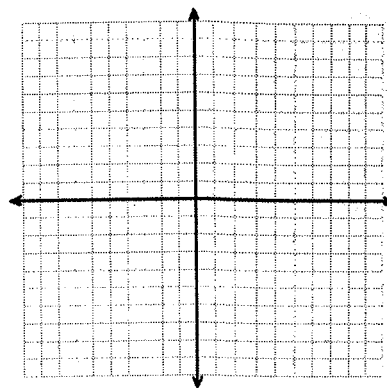
**Assignment: 7-8 #'s 3-6, 12-18**

## 7-9 Warm-Up

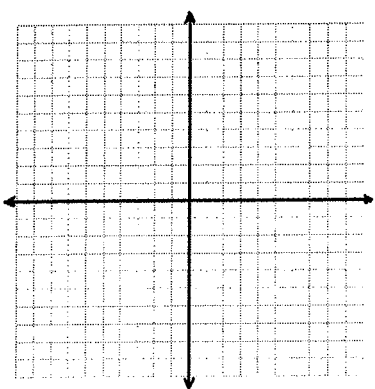
1. Graph  $x = 3$ .



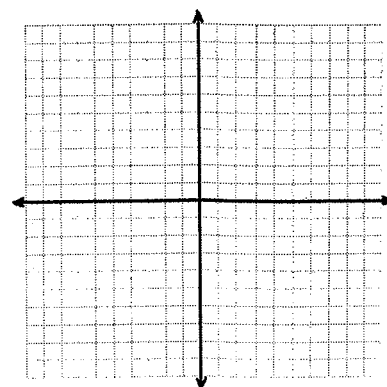
2. Graph  $x < 3$ .



3. Graph  $y = -3x + 2$ .



4. Graph  $y \geq -3x + 2$ .



## Algebra 7-9: Graphing Linear Inequalities

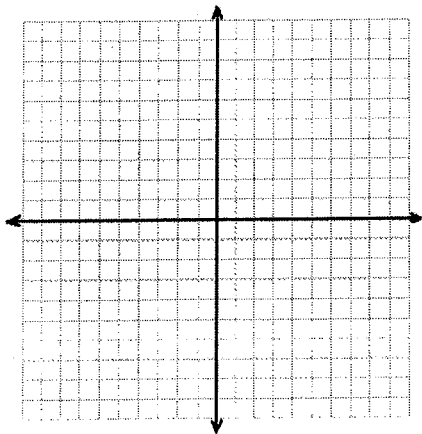
### Reminders

- Use a \_\_\_\_\_ line when the inequality is  $<$  or \_\_\_\_\_. This means that the values on the line are \_\_\_\_\_ as part of the solution.
- Use a \_\_\_\_\_ line when the inequality is  $\leq$  or \_\_\_\_\_. This means that the values on the line are \_\_\_\_\_ as part of the solution.
- If the equation is in standard form,  
\_\_\_\_\_.
- If you're not sure what side to \_\_\_\_\_, then test a point by  
\_\_\_\_\_.

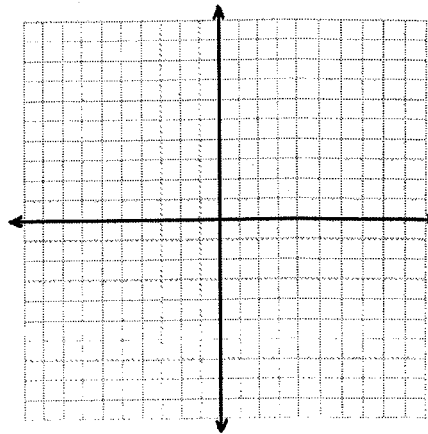
- \_\_\_\_\_ . If it \_\_\_\_\_ , then shade that side. If it \_\_\_\_\_ , then shade the other side. An easy test point is \_\_\_\_\_ .

**Examples**

1. Graph  $y < -1$ .



2. Graph  $x + y \geq 6$



3. Suppose crepe paper costs \$2.00 per package, and balloons are \$1.50 per pack. The decorations committee for the dance bought some of each and stayed within their \$60 budget.

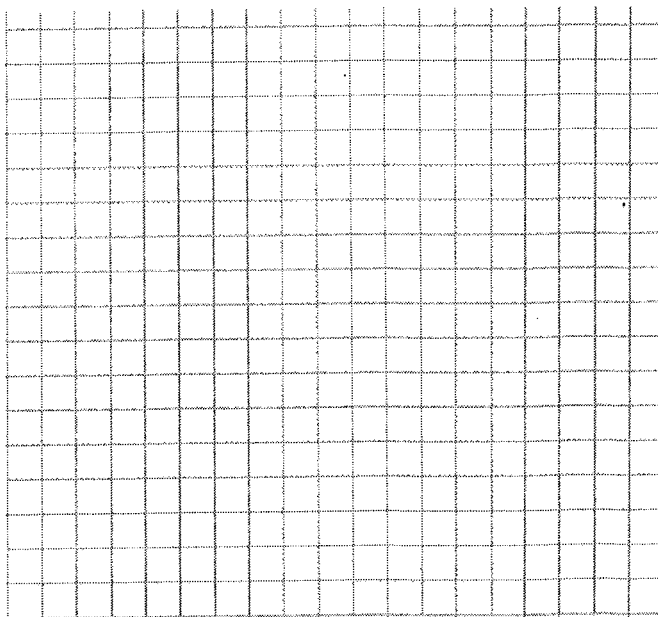
a. Write an inequality that describes the situation. \_\_\_\_\_

b. Graph the possible number of packages of each that they could have bought. Give 3 solutions.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**Assignment: 7-9 #'s 3-9, 12-16 Even (4 graphs)**

**Ch. 7 Review Day 1: Practice Test**

**Ch. 7 Review Day 2: Pg. 479 #'s 2-21**