Skill 3: Solve and Graph Compound Inequalities on a Number Line

$$3x < -6 \quad \text{or} \quad -4x - 3 \geq 9$$

Give the domain and range then decide if the relation is a function. <u>You must explain</u> why or why not!

(5,5) (8, 5) (10, 1) (8,3)

Skill 4: Solve and Graph Absolute Value Inequalities and Equations

$$|1 - 2r| \geq 9$$

Skill 5: Evaluate and Graph a Function

A radio-dispatched taxi company charges \$4.00 to pick up a passenger, then adds \$.75 per mile traveled to the destination.
The function that represents this situation is:
$C(m) = 0.75m + 4.00$, where C represents the total cost and m represents the number of miles traveled.
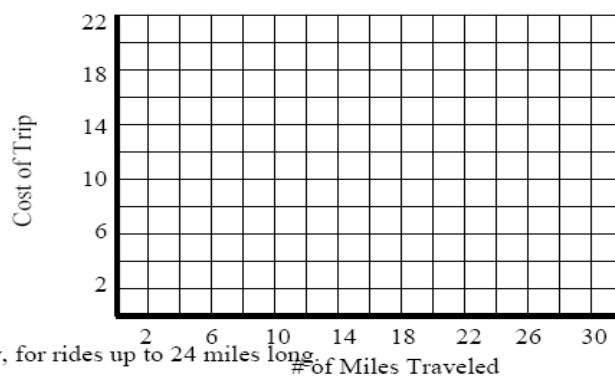
Draw a graph that shows how much it will cost to hire this company, for rides up to 24 miles long.

Use your graph to estimate how far you can travel for \$19. **Clearly show your solution on the graph and state it below.**
show work

| m	$C(m) = 0.75m + 4.00$	C
0		
6		
14		
18		
24		

Alg 1 Wk 10 Tues CW   **Stairs and Slopes**

Have you ever been to Washington, D.C.? The city has many buildings of great historical significance, such as the Washington Monument, the Capitol building, and the Lincoln Memorial. These buildings also have *stairs*! Everywhere you go in Washington D.C., you have to climb flights of stairs, or at least it seems that way. Some of the stairs have steps that are short and far apart making them less steep, others have steps that are tall and close together, making them much steeper.

The mathematical term that describes the steepness of stairs, hillsides, roads, snow board runs, etc., is called **slope**. *Slope* is a number that compares the amount of vertical change to the amount of horizontal change:

$$\text{slope} = \frac{\text{amount of vertical change}}{\text{amount of horizontal change}}$$

Slope is defined this way so that a larger slope describes a steeper set of stairs (or hill, street, mountain, etc.), because there is more vertical change compared to horizontal change. A smaller slope means less vertical change compared to horizontal change, or a flatter set of stairs.

1. The diagram to the right shows a set of five stairs. The vertical part of the stairs are called the *risers*. The horizontal part of the stairs are called the *treads*. Each riser is 6 inches tall. Each tread is 12 inches long.
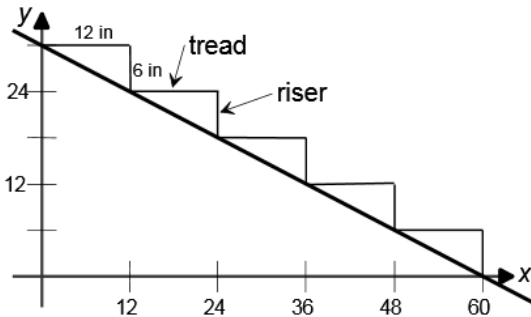
a. Calculate the slope of one stair as follows:

$$\text{slope of one stair} = \frac{\text{amount of vertical change in one stair}}{\text{amount of horizontal change in one stair}} = \frac{\text{down 6 in}}{\text{right 12 in}} = \frac{-6}{+12} = \underline{\qquad}$$

b. What is the total amount of vertical change for the entire set of stairs? (Remember to use + for up, and - for down.)

c. What is the total amount of horizontal change for the entire set of stairs? (Remember to use + for right, and - for left.)

d. Now calculate the slope for the entire set of stairs as follows:

$$\text{slope of whole set of stairs} = \frac{\text{total amount of vertical change}}{\text{total amount of horizontal change}} = \;?$$

2. Now draw a set of 8 stairs that start 10 inches above the ground and go up from there. (As you move to the right on the graph.) Let each riser be 5 inches tall, and each tread be 10 inches long.
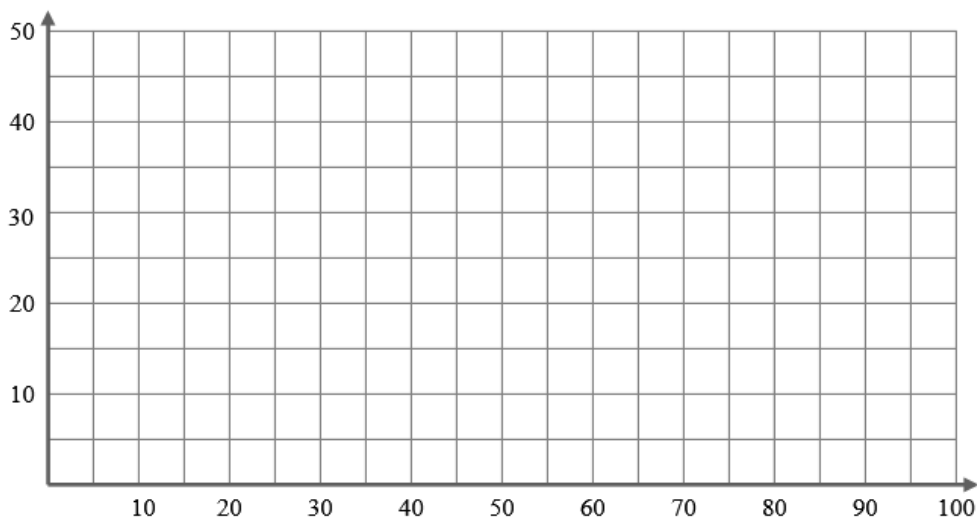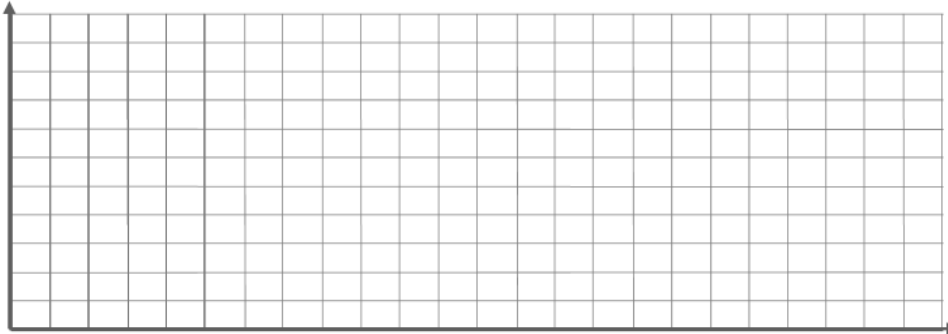

a. What is the slope of one stair?

b. What is the total vertical change for the entire set of stairs?

c. What is the total horizontal change for the entire set of stairs?

d. What is the slope of the entire set of stairs?

e. How does the slope of one stair compare with the slope of the entire set of stairs?

HW

<u>More Stairs and Slopes</u>

Draw a set of five stairs that start 3 inches above the ground, and go *up* from there. Let the risers be 6 inches tall and the treads be 9 inches wide.

go by 3's for scale

1. What is the slope of one stair?

2. What is the slope of the entire set of stairs?

3. How does the slope of one stair compare to the slope of the entire set of stairs?

4. On your graph above, draw the line that starts 3 inches above the ground and has the same slope as the stairs.

5. What is the slope of the line?
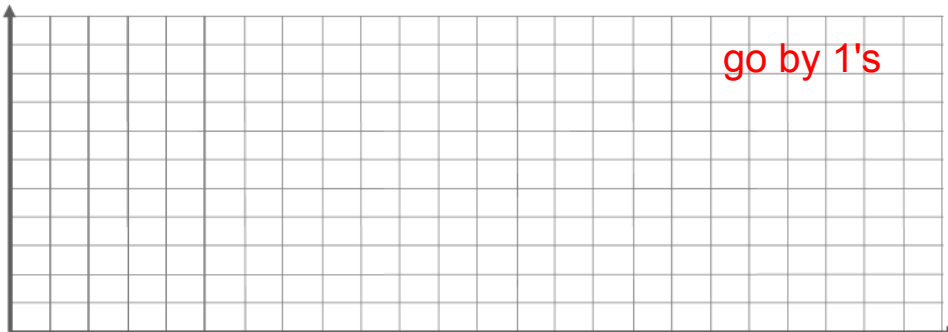
go by 1's

6. Draw a set of 6 stairs that start 9 feet above the ground and go <u>down</u> from there with 1.5-foot risers and 2-foot treads.

7. What is the slope of one stair?

8. What is the slope of the entire set of stairs?

9. How does the slope of one stair compare with the slope of the entire set of stairs?

10. Draw the line that starts where the stairs start, and has the same slope.

Algebra 1   *OBJ: Expand calculating slope and unit rates*   *5-1.C*

11. On the grid provided, draw and label each of the following lines.

   Line A: starting point (vertical or y intercept) of 1, and slope $\dfrac{2}{5}$

   Line B: starting point (vertical or y intercept) of 6, and slope $\dfrac{-1}{4}$

   Line C: starting point (vertical or y intercept) of -1, and slope $\dfrac{2}{3}$

   Line D: starting point (vertical or y intercept) of 8, and slope of $\dfrac{-4}{3}$ go by 1's

12. Which two lines have positive slopes?

13. Which of these positive slopes is the steepest?

14 How can you tell which one is steepest?

15. Which two lines have negative slopes?

16. Which of these negative slopes is the flattest?

17. How can you tell which one is flattest?

18. Of all the lines, which is the flattest?

19. Explain how you can tell which is steepest or flattest when comparing positive slopes and negative slopes

old stuff next slides!

Wk9 Tues   Chapter 3-4 Review   Name_____

Questions from Tuesday's CW/HW?

Graph each function below.

1. $y = 6 - 3x$

x	y
-2	12
-1	9
0	6
1	3
2	0
3	-3
4	-6
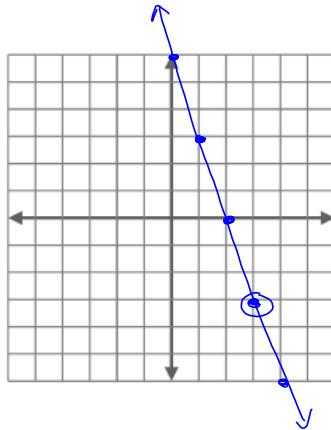
Circle on the graph the value of y when x=3

2. $d(t) = |8 - 2t|$

t	d(t)
-2	12
-1	10
0	8
1	6
2	4
3	2
4	0
5	2
6	4
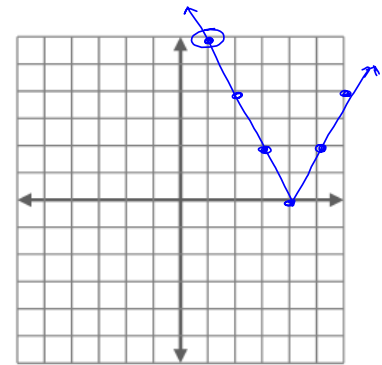
Circle on the graph the value of t when d(t)=6

3. $h(t) = -2t^2 - 4t + 6$

t	h(t)
-3	0
-2	6
-1	8
0	6
1	0
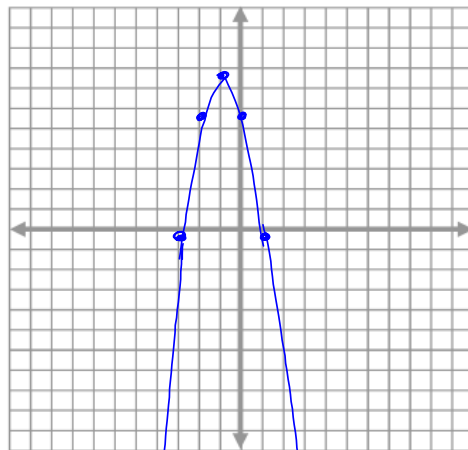
Use the graph to find h(t) when t=3

4. $f(x) = -1 + \sqrt{x + 4}$

x	f(x)
-4	-1
-3	0
0	1
5	2
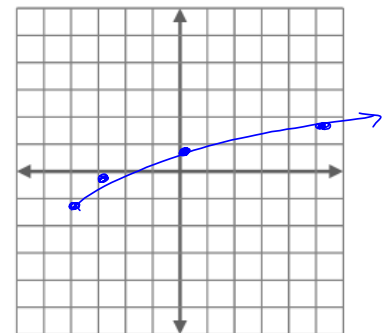
Solve and graph the equation on the number line:

5. $|8 - 2t| = 4$

$$8 - 2t = 4 \qquad 8 - 2t = -4$$
$$\underline{-8 \qquad -8} \qquad \underline{-8 \qquad -8}$$
$$\frac{-2t = -4}{-2 \quad -2} \qquad \frac{-2t = -12}{-2 \quad -2}$$
$$t = 2 \qquad\qquad t = 6$$

Solve each inequality and graph the solution set on a number line:

6. $|8 - 2t| > 4$

$8 - 2t > 4$

$-8 \quad -8$

$-2t > -4$

$\dfrac{}{-2} \quad \dfrac{}{-2}$

$t < 2$ OR

$8 - 2t < -4$

$-8 \quad -8$

$-2t < -12$

$\dfrac{}{-2} \quad \dfrac{}{-2}$

$t > 6$

7. $|3t - 6| \le 9$

$3t - 6 \le 9$

$+6 \quad +6$

$3t \le 15$

$\dfrac{}{3} \quad \dfrac{}{3}$

$t \le 5$ and

$3t - 6 \ge -9$

$+6 \quad +6$

$3t \ge -3$

$\dfrac{}{3} \quad \dfrac{}{3}$

$t \ge -1$
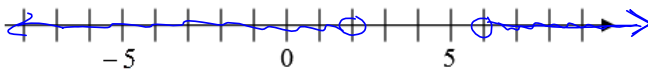
Solution $\quad t < 2$ OR $t > 6$

Solution $\quad -1 \le t \le 5$

Solve the inequality and graph it on the number line

8. $3 < 2p - 3 \le 12$

$3 < 2p - 3$

$+3 \qquad +3$

$\dfrac{6}{2} < \dfrac{2p}{2}$

$3 < p$

$2p - 3 \le 12$

$2p \le 15$

$\dfrac{2p}{2} \quad \dfrac{15}{2}$

$p \le \dfrac{15}{2}$

Solution $\quad 3 < p \le \dfrac{15}{2}$

9. $9 - c < 2 \ or -3c > 15$

$-9 \quad -9$

$-c < -7$

$\dfrac{}{-1} \quad \dfrac{}{-1}$

$c > 7$

$\dfrac{-3}{-3} \quad \dfrac{}{-3}$

$c < -5$
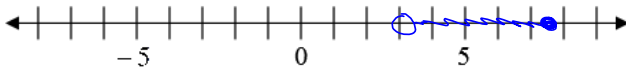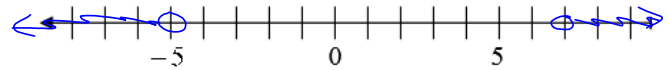
Solution $\quad c > 7$ OR $c < -5$

10. $-3(2x - 4) - 1 < -25 + 6x$

$-6x + 12 - 1 < -25 + 6x$

$-6x + 11 < -25 + 6x$

$+6x + 25 \qquad +25 + 6x$

$\dfrac{36}{12} < \dfrac{12x}{12}$
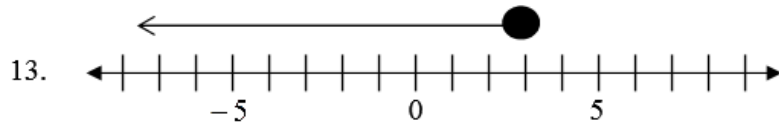
Solution $\quad x > 3$

Write an inequality to describe the given line graph.

11.

Solution $-5 < x \le 2$

12.
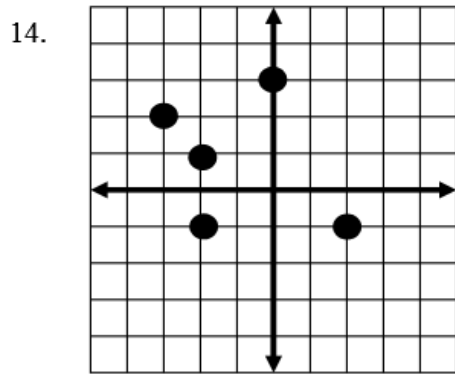
Solution: $x > -4$

13.
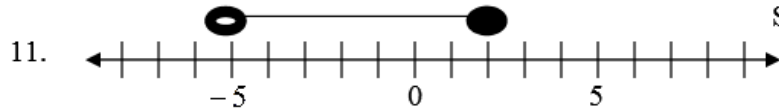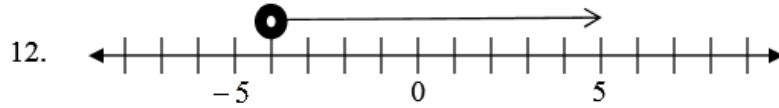
Solution: $x \le 3$

Give the domain and range then decide if the relation is a function. You must explain why or why no
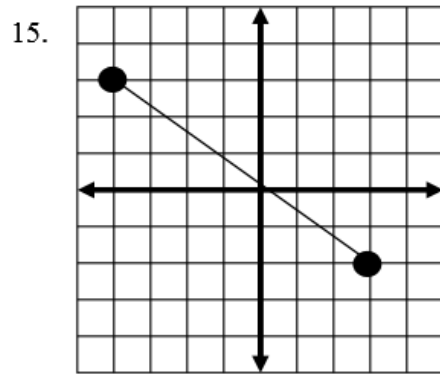
14.

Domain: $\{-3, -2, 0, 2\}$

Range: $\{-1, 1, 2, 3\}$
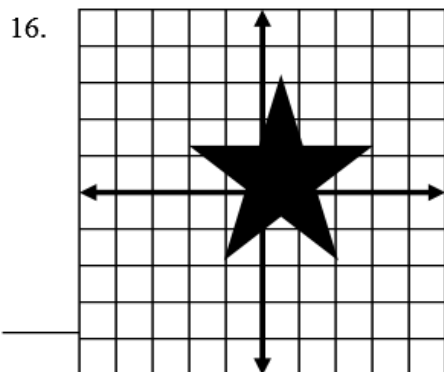
Is it a function? Y or (N)

Why:_____

15.

Domain: $-4 \le x \le 3$

Range: $-2 \le y \le 3$

Is it a function? (Y) or N

Why:_____

16.

Is it a function? Y or N

Why:_____

OBJ: Review chapter 3-4

A1 w10d2 5-1 Rate of Change & Slope.notebook

key

Algebra 1
Block week 8

TEST Chp 1-3

Name_____
Period_____

Directions: Show ALL work for full credit. Calculator is OK.

1. Evaluate:

a) $8 - 20 \div 5 \cdot 2 - 4^2$

Answer:_____(2)

b) $5 \cdot 7 - 3(10 - 2^2)$

Answer:_____ (2)

2. Is (-6,-3) a solution to $2x - 5y = -27$?

Work:

Answer:_____ (2)

3. Write the expression:

a) Five decreased by a number x

Answer:_____(1)

b) The product of 7 and a number y

Answer:_____ (1)

c) The quotient of 10 and a number w

Answer:_____ (1)

4. Simplify $4(3x - 1) + 2(x + 5)$

Answer:_____ (2)

5. If $a = 2, c = -1, and\ d = -4,$ evaluate:

$$\frac{d}{a} + c^2$$

Answer:_____ (2)

6. Solve.

a) $2w - 5 = 11$

Answer:_____ (2)

Solve.

b) $-2 = \dfrac{a}{3}$

Answer:_____ (2)

c) $3(2c+4) = 24$

Answer:_____ (2)

d) $-2w + 3 = 4w - 6$

Answer:_____ (2)

e) $9 - 3x = -3$

Answer:_____ (2)

f) $\dfrac{3x-9}{30} = \dfrac{2x+6}{10}$

Answer:_____(3)

Solve.

g) $7y - (4y - 2) = 3(y - 2) + 8$

Answer:_____(3)

12. A $73 purse is on sale for $42. What percent decrease is this? Round to the nearest tenth of a percent.

Answer:_____(2)

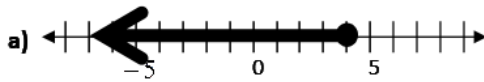13. 18 is what % of 72?

Answer:_____ (2)

14. 140 is 70% of what number?

Answer:_____ (2)

15. What is 34% of 80?

Answer:_____ (2)

16. A plane flies 4320 miles at a rate of 300mph. How long should the flight take?

Answer:_____ (2)

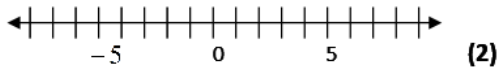**17. Write the inequality represented by each graph.**
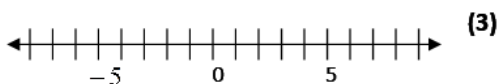
a)

Answer:_____ (1)

b)
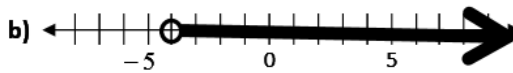
Answer:_____ (1)

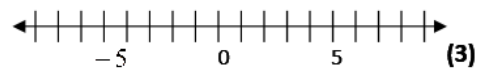**18. Solve, then graph the solutions.**

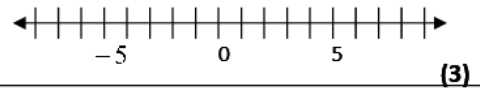a) $4x + 8 < 12$

(2)

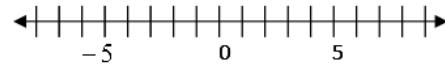b) $2y - 3(y + 4) \geq -10$

(3)

Solve, then graph the solutions.

c) $7y - 8 \leq 2(2y - 7) + 6y$

(3)

d) $\frac{x}{3} - 3 < -1$

(3)

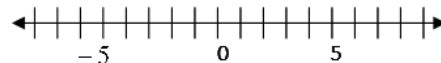e) $-7 \leq x - 4 < 1$

Solution: _____(3)

f) $2c - 3 > 3 \quad or \quad -4c \geq 8$

Solution: _____(4)

g) $c - 5 \leq 3c + 1$ *and* $5(c + 1) < 2c + 8$

Solution:_____(4)

c) $|3x + 6| < 3$

Solution:_____ (3)
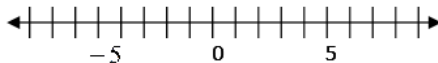
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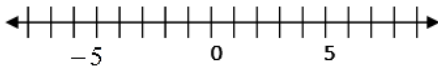
19. Solve and graph the solutions to the absolute value equation or inequality.

a) $|2x + 3| = 1$
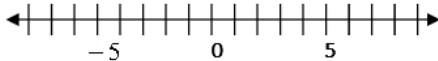
Solution:_____ (3)

b) $|x - 2| \geq 3$
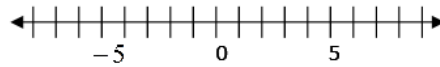
Solution:_____ (3)

EXTRA CREDIT:

A) Logan can run the 400m in 50.2 seconds. What is his speed in miles per hour? (1 m=3.28 ft; 5280 ft= 1 mile). Round to the nearest tenth.

Work:

Answer:_____ (3)

B) A train makes a trip at 75mph. It takes car traveling at 60 mph makes the same trip 1.3 hours longer than it takes the train. How far are they traveling?

Answer:_____ (3)