

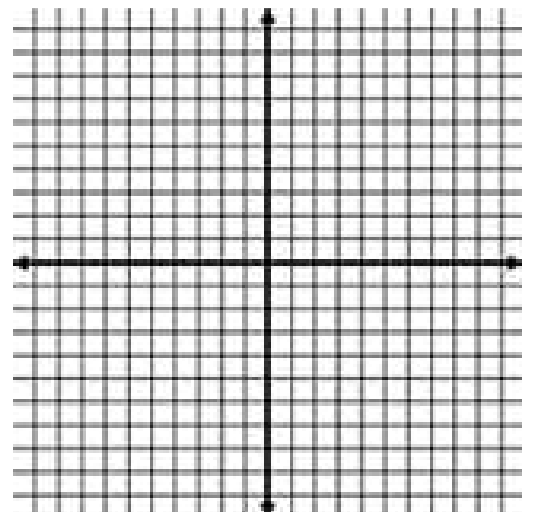
When you are done with your 8.5 homework you should be able to...

- $\pi$  Graph Linear Functions.
- $\pi$  Build Linear Models from Verbal Descriptions.
- $\pi$  Build Linear Models from Data.

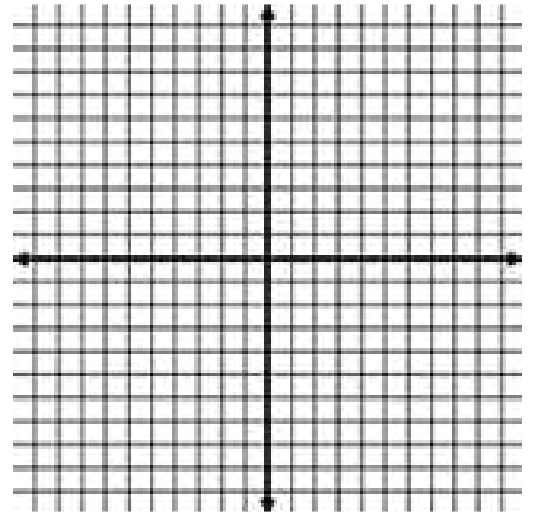
WARM-UP:

1. Find the equation of the line which passes through the ordered pairs  $\left(5, \frac{1}{2}\right)$  and  $\left(\frac{3}{2}, -2\right)$ . Write your result in slope-intercept form.

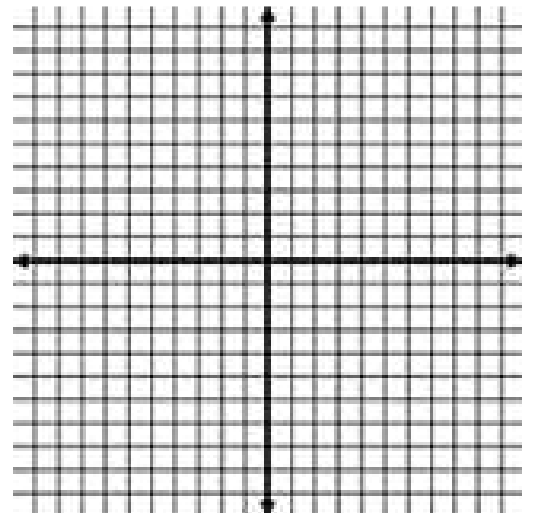
2. Graph  $y = -\frac{2}{5}x + 3$ .



3. Graph  $y = 4$ .



4. Graph  $x = -1$ .



### Definition

A **linear function** is a function of the form  $f(x) = mx + b$ , where  $m$  and  $b$  are real numbers. The graph of a linear function is called a **line**.

How can we get this equation from the standard form of a line,  $Ax + By = C$ ?

5. Change from equation notation to function notation.

a.  $6x - \frac{y}{5} = \frac{7}{4}$

b.  $4y = 2x$

c.  $-3y = 8$

### Linear Cost Function

A **linear cost function** is a function of the form  $C(x) = ax + b$ , where  $b$  represents the **fixed cost** of operating a business and  $a$  represents the **variable costs** (the cost of manufacturing one additional item).

6. Suppose that a small bicycle manufacturer has daily fixed costs of \$2500 and each bicycle costs \$75 to manufacture.

a. Write a linear function that expresses the cost of manufacturing  $x$  bicycles in a day.

b. Graph the linear function.

c. What is the cost of manufacturing 20 bicycles in a day?

d. How many bicycles can be manufactured for \$4080?

When you are done with your 8.6 homework you should be able to...

- $\pi$  Determine the Intersection or Union of Two Sets.
- $\pi$  Solve Compound Inequalities Involving "and."
- $\pi$  Solve Compound Inequalities Involving "or".
- $\pi$  Solve Problems Using Compound Inequalities.

## Definitions

- The **intersection** of two sets  $A$  and  $B$ , denoted  $A \cap B$  is the set of all elements that belong to **both** set  $A$  and set  $B$ .
- The **union** of two sets  $A$  and  $B$ , denoted  $A \cup B$  is the set of all elements that belong to set  $A$ , set  $B$  or the intersection of sets  $A$  and  $B$ .
- The word **and** implies intersection, while the word **or** implies union.

7. Solve the following compound inequalities and graph the solution set.

a.  $x \leq 6$  and  $x > 2$

b.  $2x - 1 \leq 8$  or  $x - 6 > 4$

c.  $-5x + 1 \leq 6$  and  $x > 4$

## Steps for Solving Compound Inequalities Involving "and"

Step 1: Solve each inequality separately.

Step 2: Find the **intersection** of the solution sets of each inequality.

8. Solve the compound inequalities and graph the solution set.

a.  $-10 < 6x + 8 \leq -4$

b.  $0 \leq \frac{3}{2}x - 3 < 3$

### Steps for Solving Compound Inequalities Involving "or"

Step 1: Solve each inequality separately.

Step 2: Find the **union** of the solution sets of each inequality.

9. Solve the compound inequalities and graph the solution set.

a.  $-\frac{4}{5}x - 5 > 3$  or  $7x - 3 > 4$

b.  $-x - 1 > 3$  or  $2x - 3 \leq 11$