

Solving Inequalities by Addition and Subtraction  
§5.1

$>$ ,  $<$  = ○

$\geq$ ,  $\leq$  = ●

Example 1

$$c - 12 > 65$$



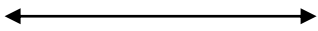
Example 2

$$41 \geq x + 17$$



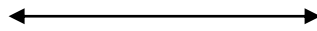
Example 3

$$2a - 7 \leq 11$$



Example 4

$$5g - 16 < 9g$$



Example 5

$$3y + 7 > 8y - 23$$



Define a variable, write an inequality, and solve.

Example 6

The difference of a number and 9 is at least 15.

Pg 286,1-7,12-31



Solving Inequalities by Multiplication and Division  
§5.2

Is  $7 > 5$ ?

Now, multiply both sides by 2. Still true?

Now, multiply both sides by -2. Still true?

Rule: if you **multiply or divide** by a **negative** number, **switch the inequality sign**.

Solve each.

Example 1

$$-2x < 10$$

Example 2

$$-\frac{3}{5}d \leq 10$$

Example 3

$$12k > -60$$

Example 4

$$-8q < -136$$

Example 5

$$-4 \geq -\frac{c}{3}$$

Example 6

Mathew walks at a rate of  $\frac{3}{4}$  mile per hour. He knows that it is at least 9 miles to Elizabeth Park.

How long will it take him to get there?

Pg 293,1-9,12-26



Solving Multistep Inequalities  
§5.3

Solve.

Example 1

$$13 - 11d \geq 79$$

Example 2

$$2(3g + 5) < 52$$

Example 3

$$5g - 13 \geq 8g + 11$$

Example 4

$$6c + 3(2 - c) \leq -2c + 1$$

Example 5

$$-7(k + 4) + 11k \geq 8k - 2(2k + 1)$$

Example 6

$$2(4r + 3) \leq 22 + 8(r - 2)$$

Example 7

Adriana has a budget of \$115 for faxes. The fax service she uses charges \$25 to activate plus \$0.08 per page to send faxes. How many pages can Adriana fax and stay within her budget?

**Pg 298, 1-7,12-22,29-32**



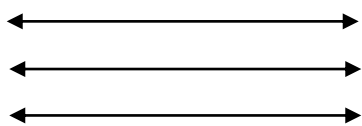
§5.4

Compound Inequality – two or more inequalities that are connected by the words *and* or *or*.  
 and (intersection): the graph where two inequalities overlap.

- $<$  or  $>$
- $\leq$  or  $\geq$

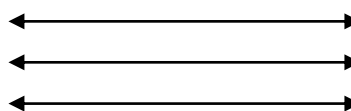
Example 1

$$x - 3 > 2 \text{ and } 7x + 20 \leq 76$$



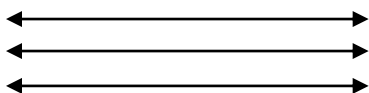
Example 2

$$3x + 5 < -7 \text{ and } 2x + 11 > -7$$



Example 3

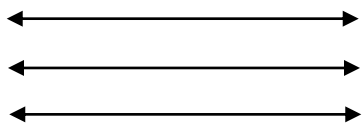
$$7 < z + 2 \leq 9$$



or (union): the graph where two inequalities are combined.

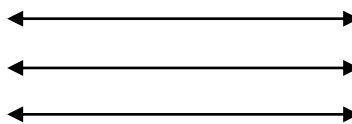
Example 4

$$y + 7 < 2 \text{ or } y - 3 > -2$$



Example 5

$$2d - 3 \geq 7 \text{ or } 3d + 4 \leq 7$$

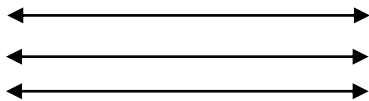
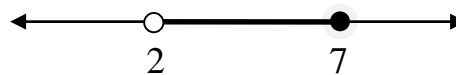


Example 6

Example 7

$$4k - 7 \leq 25 \text{ or } 12 - 9k \geq 30$$

Write the inequality of the graph below.



**Pg 306, 1,3,7-27 odd**



§5.5

Absolute Value – the distance a number is from 0 on a number line.

Fill in the variable  $|x| = 5$

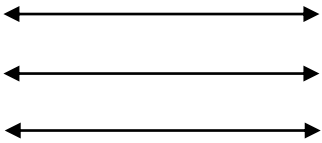
GO LA!

$>$ ,  $\geq$  OR

$<$ ,  $\leq$  AND

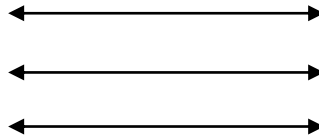
Example 1

$$|x + 3| < 12$$



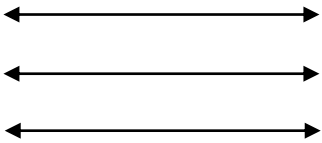
Example 2

$$|2y - 4| \geq 16$$



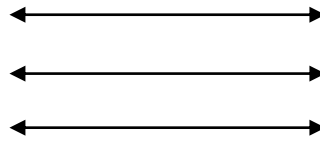
Example 3

$$|3w + 5| \leq -4$$



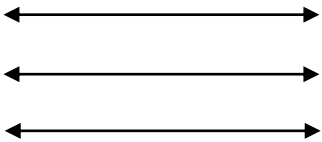
Example 4

$$|2z - 1| + 3 > 10$$



Example 5

$$|3w + 5| \leq -4$$



Example 6

The average annual rainfall in California for the last 100 years is 23 inches. However, the annual rainfall can differ by 10 inches from the 100 year average. What is the range of annual rainfall for California?

**Pg. 312, 1-29 odds**



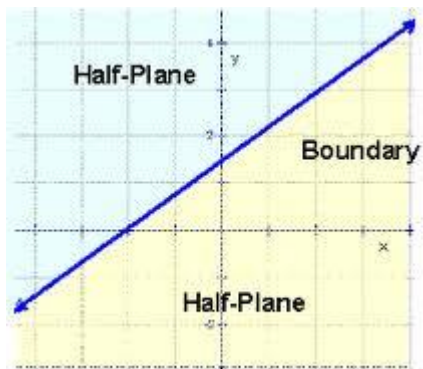
## §5.6

Boundary – a line that separates the coordinate plane into two half-planes.

Half-Planes – the region of the graph on one side of the boundary.

Closed Half-Plane – the solution of a linear inequality that includes the boundary line.

Open Half-Plane – the solution of a linear inequality that does not include the boundary line.

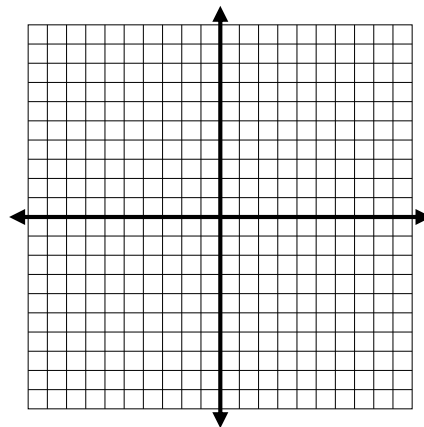
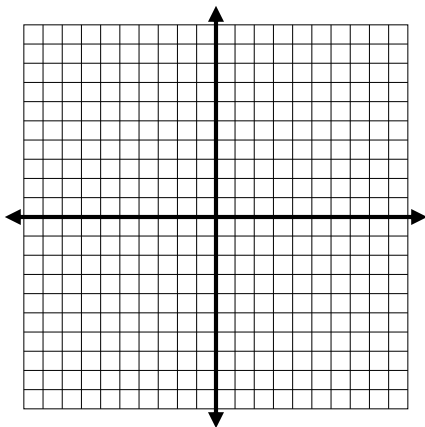


Example 1

$$3y + 4 < 2x - 11$$

Example 2

$$x + 4y \geq 8$$

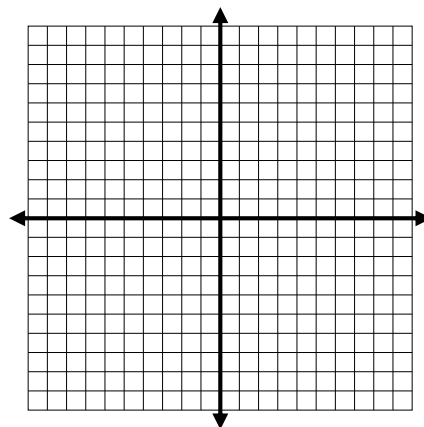
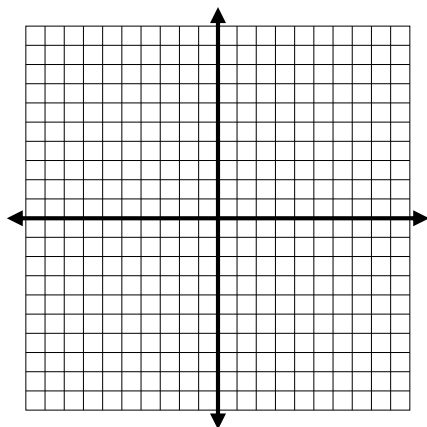


Example 3

Example 4

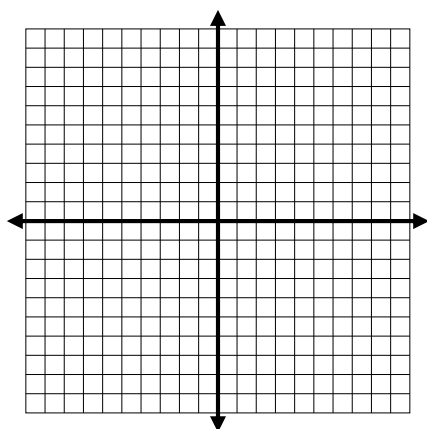
$$2y - 3x > -18$$

$$2x - 5 > -11$$



Example 5

$$2y - 4x \geq 6$$



Pg 318,1-9,13-25 odds

