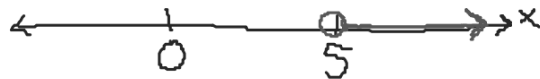


## Inequalities

The solution set for an inequality usually contains an infinite number of solutions, so the solution is often graphed.

Solve and graph the following.

1.  $x > 5$



2.  $5x + 2 \leq 13$

a. if  $x$  is a member of the set {real numbers}

$$5x \leq 11$$

$$x \leq \frac{11}{5}$$



b. if  $x$  is a member of the set {positive numbers}



c. if  $x$  is a member of the set {integers}

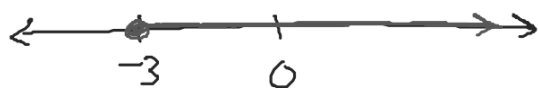


$$\frac{11}{5} = 2\frac{1}{5}$$
$$= 2.2$$

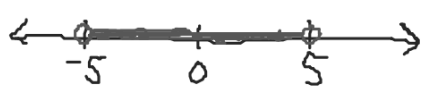
3.  $3 - 2x \leq 9$

$$-2x \leq 6$$

$$x \geq -3$$



4.  $|x| < 5$



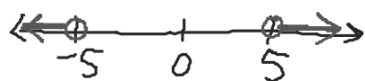
aka

$$-5 < x \text{ and } x < 5$$

$$-5 < x < 5$$

In general,  
If  $|A| < b$  (where  $b > 0$ ),  
then  $-b < A < b$

5.  $|x| > 5$



$$x < -5 \text{ or } x > 5$$

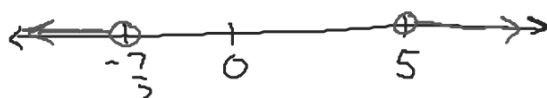
In general,  
If  $|A| > b$  (where  $b > 0$ ),  
then  $A < -b$  or  $A > b$ .

$$6. |3 - 4x| > 17$$

$$3 - 4x < -17 \quad \text{or} \quad 3 - 4x > 17$$

$$-4x < -20 \quad \text{or} \quad -4x > 14$$

$$x > 5 \quad \text{or} \quad x < -\frac{7}{2}$$



$$7. 4 < |x - 3| \leq 7$$

$$4 < |x - 3| \quad \text{and} \quad |x - 3| \leq 7$$

$$|x - 3| > 4 \quad \text{and} \quad -7 \leq x - 3 \leq 7$$

$$x - 3 < -4 \quad \text{or} \quad x - 3 > 4 \quad \text{and} \quad -4 \leq x \leq 10$$

$$x < -1 \quad \text{or} \quad x > 7 \quad \text{and} \quad -4 \leq x \leq 10$$

