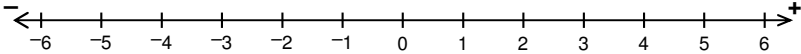
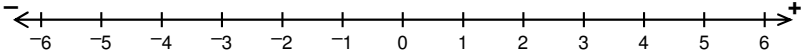


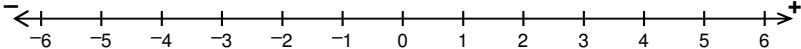
## Exploring Inequalities: Classwork

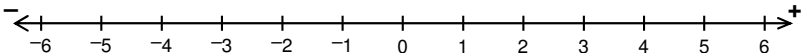
- For each of the following situations, start with the inequality:  $12 < 24$   
Perform the following operations, then tell whether it gives an inequality that is still true.
  - Add 5 to both sides.
  - Subtract 5 from both sides.
  - Multiply both sides by 10.
  - Multiply both sides by  $-10$ .
  - Divide both sides by 2.
  - Divide both sides by  $-2$ .
- For each of the following situations, start with the inequality:  $-25 < -15$   
Perform the following operations, then tell whether it gives an inequality that is still true.
  - Add 10 to both sides.
  - Subtract 10 from both sides.
  - Multiply both sides by 2.
  - Multiply both sides by  $-2$ .
  - Divide both sides by 5.
  - Divide both sides by  $-5$ .
- Time to generalize!** Look over your answers to #1 and #2.  
When does performing an operation on both sides make the inequality false?  
Why do you think that is?

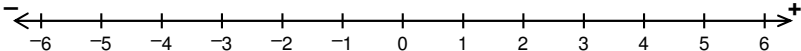
- Graph the following inequalities to represent all of the possible values of  $x$ .

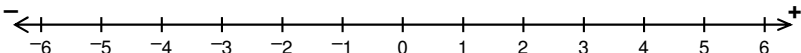
a.  $x > 4$  

b.  $-1 \leq x \leq 3$  

c.  $-3 > x$  

d.  $-4 \leq x < 1$  

e.  $0 \neq x$  

f.  $-2 < x \leq -1$  

5. **Multiple Choice.** In a residential area, cars can drive up to 25 miles per hour. Let  $x$  stand for the legal speed of a car. Which inequality represents the situation? Circle one.
- A.  $0 > x \geq 25$                       B.  $0 < x \leq 25$                       C.  $0 < x < 25$
6. Write an inequality to describe the interval referred to in each statement, then graph the inequality on a number line.
- a. To get an A, you must earn 90% or more.  
Let  $x$  represent the possible percentages for an A.
- b. To get a B, you must earn a percentage in the 80's.  
Let  $x$  represent the possible percentages for a B.
- c. The measure of an acute angle is less than  $90^\circ$ .  
Let  $x$  stand for the possible degrees of an acute angle.
- d. School starts at 7:50 and the clock says it is 7:49.  
Let  $x$  stand for the possible number of seconds until school starts.
- e. The gas tank in my car can hold up to 11 gallons.  
Let  $x$  represent the possible number of gallons in my gas tank.
- f. Miley is a teenager. Let  $x$  represent Miley's possible ages in years.  
*(Be careful, this one is trickier than you might think!)*
7. Name two values of  $x$  that would make each inequality true.
- a.  $x + 7 < 8$                       b.  $x + 7 \geq -8$                       c.  $x - 5 \leq -15$                       d.  $x - 11 > -50$
- e.  $3x > 24$                       f.  $-3x \geq 24$                       g.  $2x + 6 \leq -20$                       h.  $-6x - 2 > -20$
8. For problems like #7g, how could you find every possible value of  $x$  that makes the inequality true?

## Exploring Inequalities: Homework

9. State whether each inequality is true or false.

a.  $-2 > -200$

b.  $20(-1) \geq 5(-1)$

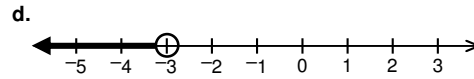
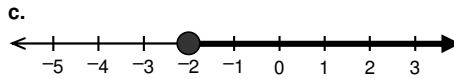
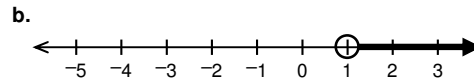
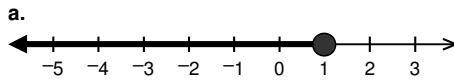
c.  $-3.5 > -0.0001$

d.  $10 + -3 > 10 - -3$

e.  $5 \times -10 > 200 \div -10$

f.  $8(-9) \leq 9(-8)$

10. Write **two** inequalities for each of the following graphs.



11. **Multiple Choice.** Water freezes when its temperature is  $32^{\circ}\text{F}$  and below. Let  $x$  represent the temperature of frozen water. Which inequality represents the situation? Circle one.

A.  $x \geq 32$

B.  $x \leq 32$

C.  $x < 32$

12. Graph the following inequalities to represent all of the possible values of  $x$ .

