Inequalities and you 1 NAME:

This worksheet will provide practice for solving and interpreting inequalities. We will first investigate the general rules for algebraically solving inequalities. We will then solve a few problems algebraically.

1. Show that if you multiply or divide an inequality by a **negative** number, you have to change the sign. (Hint: Perhaps you want to start with a true inequality like $7 > 2$. Pick any negative number and multiply both sides of the inequality by it. Indicate where the sign must be changed. Also, do the same for division.)

2. Show that if you multiply or divide an inequality by a **positive** number, you do **not** have to change the sign. (Hint: Perhaps you want to start with a true inequality like $7 > 2$. Pick any positive number and multiply both sides of the inequality by it. Notice the sign does **not** need to be changed. Also, do the same for division.)

3. Below is a possible solution to the inequality $-3(x+2) \le 8$. What, if anything, is wrong with it?

$-3(x+2) \le 8$

$-3x - 6 \le 8$

$-3x \le 14$

$x \le -4.67$

4. Solve the inequality below. Round to two decimal places where applicable. Write your solution in inequality notation, interval notation, and graph your solution on the real number line.

$-6x+4>30$

5. Solve the inequality below. Round to two decimal places where applicable. Write your solution in inequality notation, interval notation, and graph your solution on the real number line.

$2(4x-7)\leq 24$

6. Solve the inequality below. Round to two decimal places where applicable. Write your solution in inequality notation, interval notation, and graph your solution on the real number line.

$-3x-9>64$

7. Solve the inequality below. Round to two decimal places where applicable. Write your solution in inequality notation, interval notation, and graph your solution on the real number line.

$$-4 \le \frac{3x+8}{2} < 10$$

(Hint: This is a double inequality. You can solve it by solving $-4 \le \frac{3x+8}{2}$ and $\frac{3x+8}{2} < 10$ and then combining the solutions. You will find the same operations are used in solving $-4 \le \frac{3x+8}{2} < 10$ as a double inequality.)

8. Solve the inequality below. Round to two decimal places where applicable. Write your solution in inequality notation, interval notation, and graph your solution on the real number line.

$$0 > 6x + 7 > -3$$