8 Linear Inequalities

- 8.1 Writing and Graphing Inequalities
- 8.2 Solving Inequalities Using Addition or Subtraction
- 8.3 Solving Inequalities Using Multiplication or Division
- 8.4 Solving Multi-Step Inequalities



"Here is a math quiz, Descartes. Tell me about these symbols."





"Just think of the Addition Property of Inequality in this way. If Fluffy has more cat treats than you have ..."



The other means that A I have a piece of spaghetti stuck between my fangs. "

"... and you each get 2 more cat treats, then Fluffy will STILL have more cat treats than you have!"

What You **Learned Before**

Comparing Real Numbers



Because $\frac{10}{30}$ is greater than $\frac{9}{30}$,

 $\frac{1}{3}$ is greater than 0.3.

So, $\frac{1}{3} > 0.3$.

And this is supposed to help me sleep at night? "Some people remember which is bigger by thinking that < is the mouth of a hungry alligator who is trying to eat the LARGER number."

Example 2 $\sqrt{6}$ 6

Use a calculator to estimate $\sqrt{6}$.

 $\sqrt{6} \approx 2.45$

Because 2.45 is less than 6, $\sqrt{6}$ is less than 6.

So, $\sqrt{6} < 6$.

Try It Yourself

Complete the number sentence with <, >,or =.

2. 0.1 $\frac{1}{2}$ **3.** π $\sqrt{10}$ **1.** $\frac{1}{4}$ 0.25

Graphing Inequalities

Example 3 Graph $x \ge 3$.

Use a closed circle because 3 is a solution.) (Shade the number line on the side where you found the solution. 5 8 10 (Test a number to the right of 3. x = 6 is a solution. Test a number to the left of 3. x = 0 is *not* a solution.

Example 4 Graph x < -2.

Shade the number line on the side where you found the solution. (Use an open circle because -2 is *not* a solution.) -3 Test a number to the left of -2. x = -4 is a solution.) (Test a number to the right of -2. x = 0 is not a solution.)

Try It Yourself

Graph the inequality.

4. $x \ge 0$

5. *x* < 6

6. $x \le -4$ **7.** x > -10