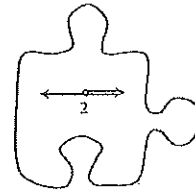
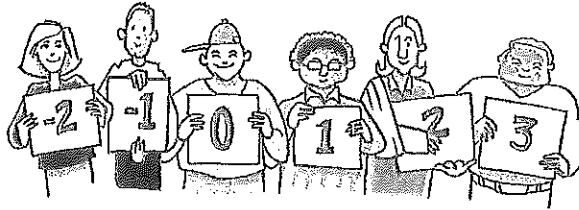


9.2.1 What if the quantities are not equal?

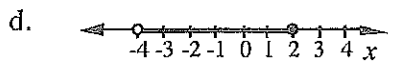
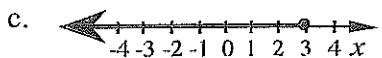
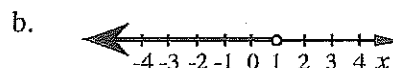
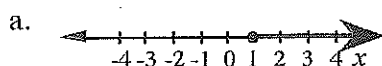
Solving Linear, One-Variable Inequalities



In this course, you have developed a variety of skills to find solutions to different kinds of equations. Now you will apply these equation-solving skills to solve inequalities.



- 9-44. As a class, create a “human number line” for each of the following mathematical sentences. You will be assigned a number to represent on the number line. When your number makes the equation or inequality true, stand up to show that your number is a solution. If your number does not make the equation or inequality true, remain seated.
- a. $x \geq -2$ b. $x \leq 1$ c. $x = 3$ d. $x \geq 0$
 e. $x = -2$ f. $-1 \leq x \leq 4$ g. $x^2 \geq 4$ h. $x < -3$
- 9-45. Based on your observations from problem 9-44, discuss the following questions with your class. Be sure to justify your responses.
- a. Compare the solutions to an inequality (like $x \geq -2$) with that of an equation (like $x = 3$). What is different? What causes this to happen?
 b. How many solutions does an inequality such as $x \leq 1$ have?
 c. How is the result of $-1 \leq x \leq 4$ different from the other inequalities? What about the result of $x^2 \geq 4$?
- 9-46. Write an inequality that represents the solutions shown on each number line below.



9-47. SOLUTIONS TO A LINEAR INEQUALITY

With your study team, find at least five x -values that make the inequality below true:

$$2x - 5 \geq 3$$

- How many solutions are there?
- What is the smallest solution for x ? This point is called a **boundary point**.
- What is the significance of the boundary point? What is its relationship with the inequality $2x - 5 \geq 3$?
- Write an inequality that represents the solutions for x . On a number line, highlight the solutions for x . Be ready to share your number line with the class.

9-48. SOLVING LINEAR INEQUALITIES WITH ONE VARIABLE

Analyze the process for solving an inequality, such as $3 - 2x < 1$, by addressing the questions below.

- The key point to start with is the boundary point. How can you quickly solve for this point? Once you have determined your strategy, find the boundary point for $3 - 2x < 1$.
- Decide if the boundary point is part of the solution to the inequality. If it *is* part of the solution, indicate this on a number line with a filled circle (point). If it is *not* a solution, show this by using an open circle as a boundary point.
- Finally, to determine on which side of the boundary the solutions lie, choose a point to test in the inequality. If the point *is* a solution, then all points on that side of the boundary are part of the solution. If the point is *not* a solution, what does that tell you about the solutions? Write your solutions to $3 - 2x < 1$ as an inequality and represent the solutions on a number line.

- 9-49. With your study team, find all of the solutions to the inequality $3x + 1 < 7$. Decide how to represent these solutions on a number line and be prepared to justify your decisions to the class.