9.2.1 What if the quantities are not equal?
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Solving Linear, One-Variable Inequalities
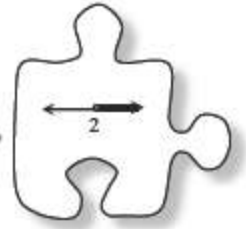
- **9-46.** Write an inequality that represents the solutions on each number line below.

  a.

  b.

  c.

  d.
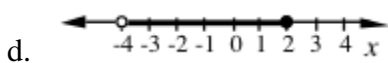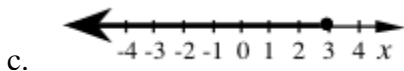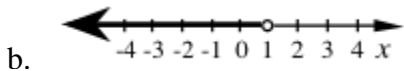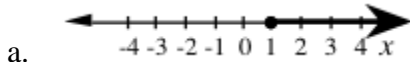
- **9-48.** SOLVING LINEAR INEQUALITIES WITH ONE VARIABLE

  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.** 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.

- **9-50.** Solve the problem below by writing and solving an equation. Be sure to define your variable.

  There are a total of 122 countries in Africa, Europe, and North America (as of 2012). Europe has twice as many countries as North America, and Africa has seven more than Europe. How many countries are in each of these three continents? Write an equation and solve it to answer this question.

- **9-51.** Solve each of the following inequalities for the given variable. Represent your solutions on a number line.

  a. $2(3p + 1) > -4$ b) $9k - 2 < 3k + 10$

  c. $5 - h \geq 4$

- **9-53.** Identify the statements below as sometimes true, always true, or never true.

  - $-4 \leq 9$

  - $x < 1$

  - $-5 > -2$

  - $3x + 5 = 2$

  - $61 = 61$

  - $-6 < -6$