

9.2 Solving Single-Step Inequalities

MathLinks 9, pages 350–359

Key Ideas Review

Decide whether each of the following statements is true or false. Circle the word True or False. If the statement is false, rewrite it to make it true.

1. **True/False** An inequality can have many specific solutions.

2. **True/False** The inequality $10 \geq -2x$ can be solved by dividing by -2 .

3. **True/False** The inequality $\frac{x}{5} < -10$ can be solved by multiplying by 5 and reversing the inequality sign.

4. **True/False** The inequality $-10x < 30$ has the same solution as the inequality $10x < -30$.

Check Your Understanding

5. Solve each inequality.

a) $x + 12 < 20$

b) $x - 7.5 \geq -12.8$

c) $160 \geq 200 + x$

6. Solve each inequality.

a) $-4x \geq 11$

b) $\frac{x}{3} < 21$

c) $-3 \leq \frac{1}{5}x$

7. Each of the cards in the following diagram shows an operation. Circle each one for which you need to reverse the inequality symbol when the operation is performed on both sides of an inequality.

$-(-3)$

$\div (-5)$

$\times 20$

-154

$+(-2)$

$\times (-0.7)$

8. For each list, circle the values that are specific solutions of the corresponding inequality.

a) 6, 7, 8, 9, 10

$$x + 5 < 13$$

b) 1.5, 2, 2.5, 3

$$2x > 5$$

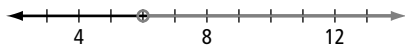
c) -25, -20, -15, -10, -5, 0

$$-5 + x \geq -15$$

d) -8, -4, 0, 4, 8

$$-4x \geq 1$$

9. Verify whether the number line below is the correct solution to the inequality $10 > x + 4$.



10. Verify whether $x \leq -5$ is the correct solution to the inequality $-8x \geq 40$. Explain.
11. Lauren works for a bookstore. One of the store's suppliers has a promotion in which any in-stock children's book costs \$4, including tax. Lauren has been told that she can spend at most \$150 on books for the store. How many books can Lauren buy and stay within the store's spending limit?
- Use an inequality to represent the situation.
 - Determine the solution and use it to solve the problem.
 - Verify your solution.

12. Customers can use a pottery studio's kiln and equipment. They can pay in two ways for access to the studio. How many uses in a year would make the members' plan the better option?

Studio Access Rates

Single Use: \$37.50 per session

Members' Plan: \$285 for unlimited use annually

- Use an inequality to represent the situation.
 - Use the inequality to solve the problem.
 - Is the boundary point itself a reasonable solution to the problem?
YES NO Explain.
13. Serena can rent a video game for \$3.49 per day. She can buy the game for \$49.95. After how many days does it become cheaper for Serena to buy the game?
- Use an inequality to represent the situation.
 - Use the inequality to solve the problem.
 - If the game takes Serena 25 h to solve and she plays 1.5 h a day, should she rent or buy the game? Verify your solution.