

Review Key Vocabulary

inequality, p. 314
solution of an inequality, p. 314

solution set, p. 314
graph of an inequality, p. 315

Review Examples and Exercises

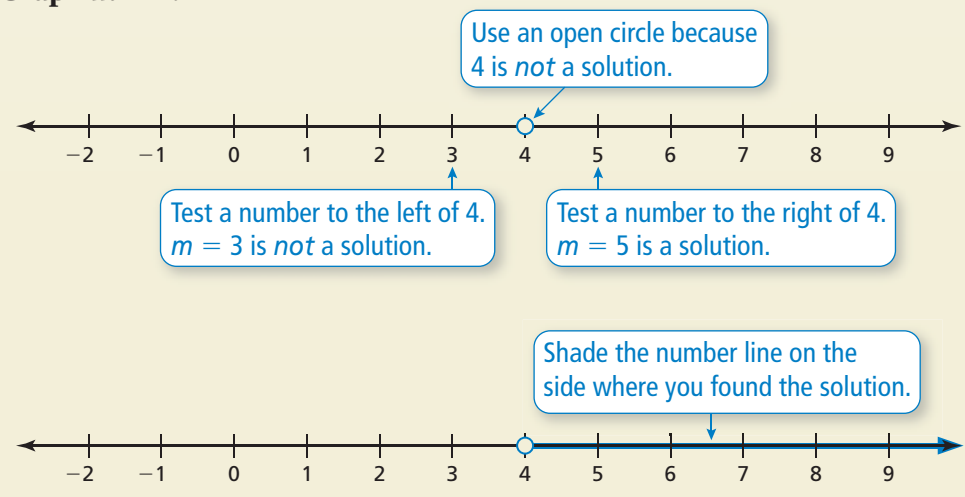
8.1 Writing and Graphing Inequalities (pp. 312–317)

a. Four plus a number w is at least $-\frac{1}{2}$. Write this sentence as an inequality.

$$\underbrace{\text{Four plus a number } w}_{4 + w} \underbrace{\text{is at least}}_{\geq} \underbrace{-\frac{1}{2}}_{-\frac{1}{2}}$$

∴ An inequality is $4 + w \geq -\frac{1}{2}$.

b. Graph $m > 4$.



Exercises

Write the word sentence as an inequality.

- A number v is less than -2 .
- A number x minus $\frac{1}{4}$ is no more than $-\frac{3}{4}$.

Tell whether the given value is a solution of the inequality.

- $10 - q < 3$; $q = 6$
- $12 \div m \geq -4$; $m = -3$

Graph the inequality on a number line.

- $p < 1.2$
- $n > 10\frac{1}{4}$

8.2 Solving Inequalities Using Addition or Subtraction (pp. 318–323)

Solve $-4 < n - 3$. Graph the solution.

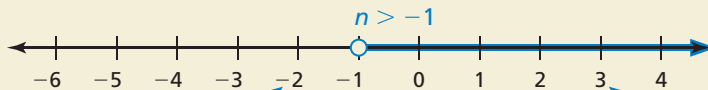
$$-4 < n - 3 \quad \text{Write the inequality.}$$

Undo the subtraction.

$$\xrightarrow{+3 \quad +3} \quad \text{Add 3 to each side.}$$

$$-1 < n \quad \text{Simplify.}$$

∴ The solution is $n > -1$.



Check: $n = -2$ is *not* a solution.

Check: $n = 3$ is a solution.

Exercises

Solve the inequality. Graph the solution.

7. $b + 13 < 18$

8. $x - 3 \leq 10$

9. $y + 1 \geq -2$

8.3 Solving Inequalities Using Multiplication or Division (pp. 326–333)

Solve $-8a \geq -48$. Graph the solution.

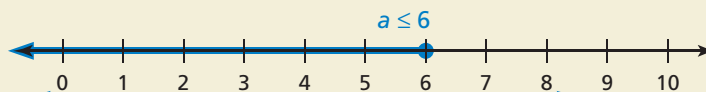
$$-8a \geq -48 \quad \text{Write the inequality.}$$

Undo the multiplication.

$$\xrightarrow{\frac{-8a}{-8} \leq \frac{-48}{-8}} \quad \text{Divide each side by } -8. \text{ Reverse the inequality symbol.}$$

$$a \leq 6 \quad \text{Simplify.}$$

∴ The solution is $a \leq 6$.



Check: $a = 0$ is a solution.

Check: $a = 8$ is *not* a solution.

Exercises

Solve the inequality. Graph the solution.

10. $\frac{x}{2} \geq 4$

11. $4z < -44$

12. $-2q \geq -18$

8.4

Solving Multi-Step Inequalities (pp. 334–339)

a. Solve $2x - 3 \leq -9$. Graph the solution.

$$2x - 3 \leq -9 \quad \text{Write the inequality.}$$

Step 1: Undo the subtraction.

$$\rightarrow +3 \quad +3 \quad \text{Add 3 to each side.}$$

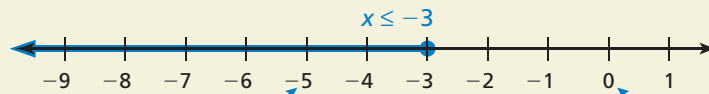
$$2x \leq -6 \quad \text{Simplify.}$$

Step 2: Undo the multiplication.

$$\rightarrow \frac{2x}{2} \leq \frac{-6}{2} \quad \text{Divide each side by 2.}$$

$$x \leq -3 \quad \text{Simplify.}$$

∴ The solution is $x \leq -3$.



Check: $x = -5$ is a solution.

Check: $x = 0$ is not a solution.

b. Solve $\frac{t}{-3} + 4 > 7$. Graph the solution.

$$\frac{t}{-3} + 4 > 7 \quad \text{Write the inequality.}$$

Step 1: Undo the addition.

$$\rightarrow -4 \quad -4 \quad \text{Subtract 4 from each side.}$$

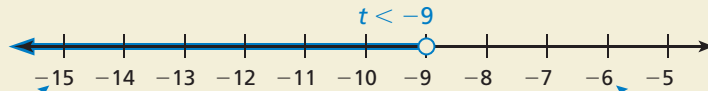
$$\frac{t}{-3} > 3 \quad \text{Simplify.}$$

Step 2: Undo the division.

$$\rightarrow -3 \cdot \frac{t}{-3} < -3 \cdot 3 \quad \text{Multiply each side by } -3. \text{ Reverse the inequality symbol.}$$

$$t < -9 \quad \text{Simplify.}$$

∴ The solution is $t < -9$.



Check: $t = -15$ is a solution.

Check: $t = -6$ is not a solution.

Exercises

Solve the inequality. Graph the solution.

13. $4x + 3 < 11$

14. $\frac{z}{-4} - 3 \leq 1$

15. $-3w - 4 > 8$

16. $8(q + 2) < 40$

17. $-\frac{1}{2}(p + 4) \leq 18$

18. $1.5(k + 3.2) \geq 6.9$