



Solving Two-Step Inequalities (pp. 146-151)

a. Solve $6x - 8 \leq 10$. Graph the solution.

Step 1: Undo the subtraction.

$$6x - 8 \leq 10$$

$$\xrightarrow{+8 \quad +8}$$

$$6x \leq 18$$

Write the inequality.

Addition Property of Inequality

Simplify.

Step 2: Undo the multiplication.

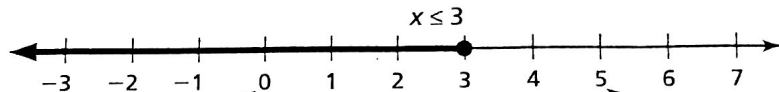
$$\xrightarrow{\frac{6x}{6} \leq \frac{18}{6}}$$

$$x \leq 3$$

Division Property of Inequality

Simplify.

∴ The solution is $x \leq 3$.



$x = 0$ is a solution.

$x = 5$ is not a solution.

b. Solve $\frac{q}{-4} + 7 < 11$. Graph the solution.

Step 1: Undo the addition.

$$\frac{q}{-4} + 7 < 11$$

$$\xrightarrow{-7 \quad -7}$$

$$\frac{q}{-4} < 4$$

Write the inequality.

Subtraction Property of Inequality

Simplify.

Step 2: Undo the division.

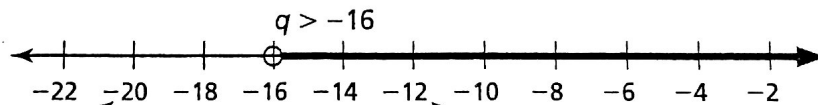
$$\xrightarrow{-4 \cdot \frac{q}{-4} \geq -4 \cdot 4}$$

Use the Multiplication Property of Inequality.
Reverse the inequality symbol.

$$q > -16$$

Simplify.

∴ The solution is $q > -16$.



$q = -20$ is not a solution.

$q = -12$ is a solution.

Exercises

Solve the inequality. Graph the solution.

14. $3x + 4 > 16$

15. $\frac{z}{-2} - 6 \leq -2$

16. $-2t - 5 < 9$

17. $7(q + 2) < -77$

18. $-\frac{1}{3}(p + 9) \leq 4$

19. $1.2(j + 3.5) \geq 4.8$

Exercises

Check It Out
 Help with Homework
 BigIdeasMath.com



Vocabulary and Concept Check

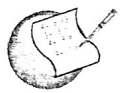
- WRITING** Explain how to identify the terms of $3y - 4 - 5y$.
- WRITING** Describe how to combine like terms in the expression $3n + 4n - 2$.
- VOCABULARY** Is the expression $3x + 2x - 4$ in simplest form? Explain.
- REASONING** Which algebraic expression is in simplest form? Explain.

$5x - 4 + 6y$

$4x + 8 - x$

$3(7 + y)$

$12n - n$



Practice and Problem Solving

Identify the terms and like terms in the expression.

1 5. $t + 8 + 3t$

6. $3z + 4 + 2 + 4z$

7. $2n - n - 4 + 7n$

8. $-x - 9x^2 + 12x^2 + 7$

9. $1.4y + 5 - 4.2 - 5y^2 + z$

10. $\frac{1}{2}s - 4 + \frac{3}{4}s + \frac{1}{8} - s^3$

11. **ERROR ANALYSIS** Describe and correct the error in identifying the like terms in the expression.



$3x - 5 + 2x^2 + 9x = 3x + 2x^2 + 9x - 5$

Like Terms: $3x$, $2x^2$, and $9x$

Simplify the expression.

2 12. $12g + 9g$

13. $11x + 9 - 7$

14. $8s - 11s + 6$

15. $4.2v - 5 - 6.5v$

16. $8 + 4a + 6.2 - 9a$

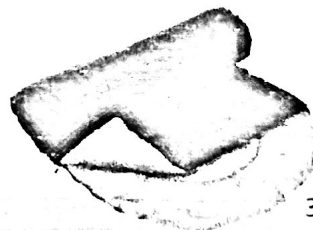
17. $\frac{2}{5}y - 4 + 7 - \frac{9}{10}y$

3 18. $4(b - 6) + 19$

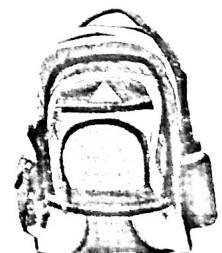
19. $4p - 5(p + 6)$

20. $-\frac{2}{3}(12c - 9) + 14c$

21. **HIKING** On a hike, each hiker carries the items shown. Write an expression in simplest form that represents the weight carried by x hikers. Interpret the expression.



3.4 lb



4.6 lb



2.2 lb