5 CHAPTER REVIEW

@HomeTutor
my.hrw.com
- Multi-Language Glossary
- Vocabulary practice

REVIEW KEY VOCABULARY

- graph of an inequality
- equivalent inequalities
- compound inequality
- absolute value equation
- absolute deviation
- linear inequality in two variables
- solution of an inequality in two variables
- graph of an inequality in two variables, half-plane

VOCABULARY EXERCISES

1. Translate the verbal sentence into an absolute value equation: "The absolute deviation of x from 19 is 8."
2. Identify three ordered pairs that are solutions of $2x - 3y \geq -10$.
3. **WRITING** When you graph a linear inequality in two variables, how do you know whether the boundary line is a solid line or a dashed line? How do you know which half-plane to shade?

REVIEW EXAMPLES AND EXERCISES

Use the review examples and exercises below to check your understanding of the concepts you have learned in each lesson of this chapter.

5.1 Solve Inequalities Using Addition and Subtraction

EXAMPLE

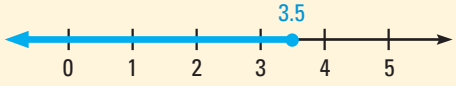
Solve $x - 2.1 \leq 1.4$. Graph your solution.

$$x - 2.1 \leq 1.4$$ Write original inequality.

$$x - 2.1 + 2.1 \leq 1.4 + 2.1$$ Add 2.1 to each side.

$$x \leq 3.5$$ Simplify.

▶ The solutions are all real numbers less than or equal to 3.5.



EXAMPLES 1, 2, 3, and 4 for Exs. 4–7

EXERCISES

4. **GEOGRAPHY** The lowest elevation in Mexico is -10 meters at Laguna Salada. Write and graph an inequality that describes all elevations in Mexico that are greater than the lowest elevation.

Solve the inequality. Graph your solution.

5. $x + 5 > -13$
6. $m - 9 \geq -4$
7. $s + 3.7 < 1$

5 CHAPTER REVIEW

5.2 Solve Inequalities Using Multiplication and Division

EXAMPLE

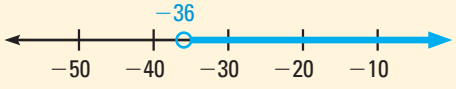
Solve $\frac{x}{-4} < 9$. Graph your solution.

$\frac{x}{-4} < 9$ — Write original inequality.

$-4 \cdot \frac{x}{-4} > -4 \cdot 9$ — Multiply each side by -4. Reverse inequality symbol.

$x > -36$ — Simplify.

▸ The solutions are all real numbers greater than -36.



EXERCISES

EXAMPLES 1, 2, 3, 4, and 5 for Exs. 8–12

Solve the inequality. Graph your solution.

8. $\frac{p}{2} \leq 5$ **9.** $\frac{n}{-4.5} < -8$ **10.** $-3x > 27$ **11.** $2y \geq 18$

12. GYMNASTICS In men's gymnastics, an athlete competes in 6 events. Suppose that an athlete's average score per event is at most 9.7 points. Write and solve an inequality to find the possible total scores for the athlete.

5.3 Solve Multi-Step Inequalities

EXAMPLE

Solve $-4x + 7 \geq -13$. Graph your solution.

$-4x + 7 \geq -13$ — Write original inequality.

$-4x \geq -20$ — Subtract 7 from each side.

$x \leq 5$ — Divide each side by -4. Reverse inequality symbol.

▸ The solutions are all real numbers less than or equal to 5.

EXERCISES

EXAMPLES 1, 2, 3, and 4 for Exs. 13–19

Solve the inequality, if possible. Graph your solution.

13. $2g + 11 < 25$ **14.** $\frac{2}{3}r - 4 \geq 1$ **15.** $1 - 3x \leq -14 + 2x$

16. $3(q + 1) < 3q + 7$ **17.** $8(t - 1) > -8 + 8t$ **18.** $-3(2n - 1) \geq 1 - 8n$

19. TICKET PURCHASES You can order discount movie tickets from a website for \$7 each. You must also pay a shipping fee of \$4. You want to spend no more than \$40 on movie tickets. Find the possible numbers of movie tickets that you can order.

5.4 Solve Compound Inequalities

EXAMPLE

Solve $-1 < -2x + 7 < 9$. Graph your solution.

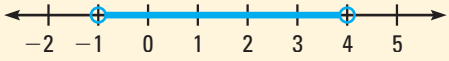
$-1 < -2x + 7 < 9$ — Write original inequality.

$-8 < -2x < 2$ — Subtract 7 from each expression.

$4 > x > -1$ — Divide each expression by -2. Reverse both inequality symbols.

$-1 < x < 4$ — Rewrite in the form $a < x < b$.

▶ The solutions are all real numbers greater than -1 *and* less than 4.



EXERCISES

EXAMPLES 3, 4, and 5 for Exs. 20–23

Solve the inequality. Graph your solution.

20. $-6 \le 2t - 5 \le -3$

21. $-3 < -3x + 8 < 11$

22. $9s - 6 < 12$ *or* $3s + 1 > 13$

23. $-4w + 12 \ge 10$ *or* $5w - 14 > -4$

5.5 Solve Absolute Value Equations

EXAMPLE

Solve $4|5x - 3| + 6 = 30$.

First, rewrite the equation in the form $|ax + b| = c$.

$4|5x - 3| + 6 = 30$ — Write original equation.

$4|5x - 3| = 24$ — Subtract 6 from each side.

$|5x - 3| = 6$ — Divide each side by 4.

Next, solve the absolute value equation.

$5x - 3 = 6$ *or* $5x - 3 = -6$ — Rewrite as two equations.

$5x = 9$ *or* $5x = -3$ — Add 3 to each side.

$x = 1.8$ *or* $x = -0.6$ — Divide each side by 5.

▶ The solutions are -0.6 and 1.8.

EXERCISES

EXAMPLES 1, 2, 3, 4, and 5 for Exs. 24–30

Solve the equation, if possible.

24. $|r| = 7$

25. $|a + 6| = 2$

26. $|2c + 5| = 21$

27. $2|x - 3| + 1 = 5$

28. $3|2q + 1| - 5 = 1$

29. $4|3p - 2| + 5 = 11$

30. BOWLING In tenpin bowling, the height of each bowling pin must be 15 inches with an absolute deviation of 0.03125 inch. Find the minimum and maximum possible heights of a bowling pin.

5 CHAPTER REVIEW

5.6 Solve Absolute Value Inequalities

EXAMPLE

Solve $3|2x + 11| + 2 \leq 17$. Graph your solution.

$3|2x + 11| + 2 \leq 17$ — Write original inequality.

$3|2x + 11| \leq 15$ — Subtract 2 from each side.

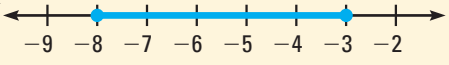
$|2x + 11| \leq 5$ — Divide each side by 3.

$-5 \leq 2x + 11 \leq 5$ — Rewrite as compound inequality.

$-16 \leq 2x \leq -6$ — Subtract 11 from each expression.

$-8 \leq x \leq -3$ — Divide each expression by 2.

▶ The solutions are all real numbers greater than or equal to -8 *and* less than or equal to -3.



EXERCISES

EXAMPLES 1, 2, and 3 for Exs. 31–36

Solve the inequality. Graph your solution.

31. $|m| \geq 8$

32. $|6k + 1| \geq 2$

33. $|3g - 2| < 5$

34. $6|3x + 5| \leq 14$

35. $|2j - 9| - 2 > 10$

36. $5|d + 8| - 7 > 13$

5.7 Graph Linear Inequalities in Two Variables

EXAMPLE

Graph the inequality $y < 3x - 1$.

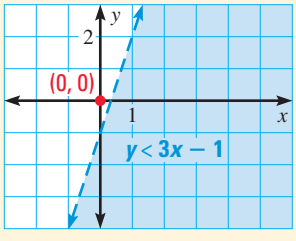
STEP 1 **Graph** the equation $y = 3x - 1$. The inequality is $<$, so use a dashed line.

STEP 2 **Test** $(0, 0)$ in $y < 3x - 1$.

$0 \stackrel{?}{<} 3(0) - 1$

$0 < -1$ ✗

STEP 3 **Shade** the half-plane that does not contain $(0, 0)$, because $(0, 0)$ is *not* a solution of the inequality.



EXERCISES

EXAMPLES 1, 2, 3, 4, and 5 for Exs. 37–44

Tell whether the ordered pair is a solution of $-3x + 2y \geq 16$.

37. $(-2, 8)$

38. $(-1, -1)$

39. $(-2, 10)$

40. $(9, -5)$

Graph the inequality.

41. $y > 2x + 3$

42. $y \leq \frac{1}{2}x - 1$

43. $3x - 2y < 12$

44. $y \geq 3$