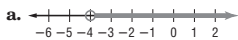


6-1 Practice**Solving Inequalities by Addition and Subtraction**

Match each inequality with its corresponding graph.

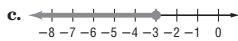
1. $-8 \geq x - 15$ **b**



2. $4x + 3 < 5x$ **d**



3. $8x > 7x - 4$ **a**



4. $12 + x \leq 9$ **c**



Solve each inequality. Then check your solution, and graph it on a number line.

5. $r - (-5) > -2$ $\{r \mid r > -7\}$



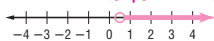
6. $3x + 8 \geq 4x$ $\{x \mid x \leq 8\}$



7. $n - 2.5 \geq -5$ $\{n \mid n \geq -2.5\}$



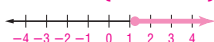
8. $1.5 < y + 1$ $\{y \mid y > 0.5\}$



9. $z + 3 > \frac{2}{3}$ $\{z \mid z > -2\frac{1}{3}\}$



10. $\frac{1}{2} \leq c - \frac{3}{4}$ $\{c \mid c \geq 1\frac{1}{4}\}$

Define a variable, write an inequality, and solve each problem. Then check your solution. **11–14. Sample answer: Let n = the number.**

11. The sum of a number and 17 is no less than 26.

$$n + 17 \geq 26; \{n \mid n \geq 9\}$$

12. Twice a number minus 4 is less than three times the number.

$$2n - 4 < 3n; \{n \mid n > -4\}$$

13. Twelve is at most a number decreased by 7.

$$12 \leq n - 7; \{n \mid n \geq 19\}$$

14. Eight plus four times a number is greater than five times the number.

$$8 + 4n > 5n; \{n \mid n < 8\}$$

- 15.
- ATMOSPHERIC SCIENCE**
- The troposphere extends from the earth's surface to a height of 6–12 miles, depending on the location and the season. If a plane is flying at an altitude of 5.8 miles, and the troposphere is 8.6 miles deep in that area, how much higher can the plane go without leaving the troposphere?
- no more than 2.8 mi**

- 16.
- EARTH SCIENCE**
- Mature soil is composed of three layers, the uppermost being topsoil. Jamal is planting a bush that needs a hole 18 centimeters deep for the roots. The instructions suggest an additional 8 centimeters depth for a cushion. If Jamal wants to add even more cushion, and the topsoil in his yard is 30 centimeters deep, how much more cushion can he add and still remain in the topsoil layer?
- no more than 4 cm**

6-2 Practice**Solving Inequalities by Multiplication and Division**

Match each inequality with its corresponding statement.

- | | |
|-----------------------------------|---|
| 1. $-4n \geq 5$ d | a. Negative four times a number is less than five. |
| 2. $\frac{4}{5}n > 5$ f | b. Four fifths of a number is no more than five. |
| 3. $4n \leq 5$ e | c. Four times a number is fewer than five. |
| 4. $\frac{4}{5}n \leq 5$ b | d. Negative four times a number is no less than five. |
| 5. $4n < 5$ c | e. Four times a number is at most five. |
| 6. $-4n < 5$ a | f. Four fifths of a number is more than five. |

Solve each inequality. Then check your solution.

- | | | | |
|---|---|---|--|
| 7. $-\frac{a}{5} < -14$
{a a > 70} | 8. $-13h \leq 52$
{h h \geq -4} | 9. $\frac{s}{16} \geq -6$
{s s \geq -96} | 10. $39 > 13p$
{p p < 3} |
| 11. $\frac{2}{3}n > -12$
{n n > -18} | 12. $-\frac{5}{9}t < 25$
{t t > -45} | 13. $-\frac{3}{5}m \leq -6$
{m m \geq 10} | 14. $\frac{10}{3}k \geq -10$
{k k \geq -3} |
| 15. $-3b \leq 0.75$
{b b \geq -0.25} | 16. $-0.9c > -9$
{c c < 10} | 17. $0.1x \geq -4$
{x x \geq -40} | 18. $-2.3 < \frac{j}{4}$
{j j > -9.2} |
| 19. $-15y < 3$
{y y > -\frac{1}{5}} | 20. $2.6v \geq -20.8$
{v v \geq -8} | 21. $0 > -0.5u$
{u u > 0} | 22. $\frac{7}{8}f \leq -1$
{f f \leq -\frac{8}{7}} |

Define a variable, write an inequality, and solve each problem. Then check your solution. **23–25. Sample answer: Let n = the number.**

23. Negative three times a number is at least 57. **$-3n \geq 57$; $\{n | n \leq -19\}$**
24. Two thirds of a number is no more than -10 . **$\frac{2}{3}n \leq -10$; $\{n | n \leq -15\}$**
25. Negative three fifths of a number is less than -6 . **$-\frac{3}{5}n < -6$; $\{n | n > 10\}$**
26. **FLOODING** A river is rising at a rate of 3 inches per hour. If the river rises more than 2 feet, it will exceed flood stage. How long can the river rise at this rate without exceeding flood stage? **no more than 8 h**
27. **SALES** Pet Supplies makes a profit of \$5.50 per bag on its line of natural dog food. If the store wants to make a profit of no less than \$5225 on natural dog food, how many bags of dog food does it need to sell? **at least 950 bags**

6-3 Practice**Solving Multi-Step Inequalities**

Justify each indicated step.

1. $x > \frac{5x - 12}{8}$

$8x > (8) \frac{5x - 12}{8}$ a. ?

$8x > 5x - 12$

$8x - 5x > 5x - 12 - 5x$ b. ?

$3x > -12$

$\frac{3x}{3} > \frac{-12}{3}$ c. ?

$x > -4$

2. $2(2h + 2) < 2(3h + 5) - 12$

$4h + 4 < 6h + 10 - 12$ a. ?

$4h + 4 < 6h - 2$

$4h + 4 - 6h < 6h - 2 - 6h$ b. ?

$-2h + 4 < -2$

$-2h + 4 - 4 < -2 - 4$ c. ?

$-2h < -6$

$\frac{-2h}{-2} > \frac{-6}{-2}$ d. ?

$h > 3$

- a. Multiply each side by 8.
 b. Subtract $5x$ from each side.
 c. Divide each side by 3.

- a. Distributive Property
 b. Subtract $6h$ from each side.
 c. Subtract 4 from each side.
 d. Divide each side by -2 and change $<$ to $>$.

Solve each inequality. Then check your solution.

3. $-5 - \frac{t}{6} \geq -9$

4. $4u - 6 \geq 6u - 20$

5. $13 > \frac{2}{3}a - 1$

$\{t \mid t \leq 24\}$

$\{u \mid u \leq 7\}$

$\{a \mid a < 21\}$

6. $\frac{w+3}{2} < -8$ $\{w \mid w < -19\}$

7. $\frac{3f-10}{5} > 7$ $\{f \mid f > 15\}$

8. $h \leq \frac{6h+3}{5}$ $\{h \mid h \geq -3\}$

9. $3(z+1) + 11 < -2(z+13)$ $\{z \mid z < -8\}$

10. $3e + 2(4e + 2) \leq 2(6e + 1)$ $\{e \mid e \geq 2\}$

11. $5n - 3(n - 6) \geq 0$ $\{n \mid n \geq -9\}$

Define a variable, write an inequality, and solve each problem. Then check your solution. 12–13. Sample answer: Let n = the number.

12. A number is less than one fourth the sum of three times the number and four.

$n < \frac{3n+4}{4}$; $\{n \mid n < 4\}$

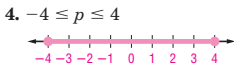
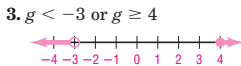
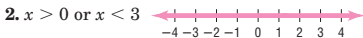
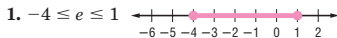
13. Two times the sum of a number and four is no more than three times the sum of the number and seven decreased by four.
- $2(n+4) \leq 3(n+7) - 4$
- ;
- $\{n \mid n \geq -9\}$

- 14.
- GEOMETRY**
- The area of a triangular garden can be no more than 120 square feet. The base of the triangle is 16 feet. What is the height of the triangle?
- no more than 15 ft**

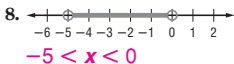
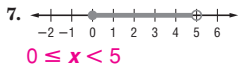
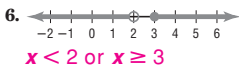
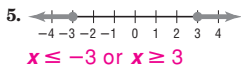
- 15.
- MUSIC PRACTICE**
- Nabuko practices the violin at least 12 hours per week. She practices for three fourths of an hour each session. If Nabuko has already practiced 3 hours in one week, how many sessions remain to meet or exceed her weekly practice goal?
- at least 12 sessions**

6-4 Practice**Solving Compound Inequalities**

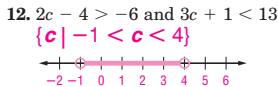
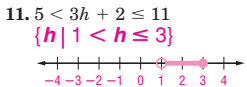
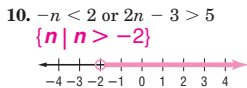
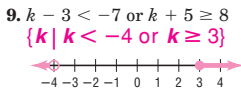
Graph the solution set of each compound inequality.



Write a compound inequality for each graph.



Solve each compound inequality. Then graph the solution set.

Define a variable, write an inequality, and solve each problem. Then check your solution. 13–14. Sample answer: Let n = the number.

13. Two times a number plus one is greater than five and less than seven.
-
- $5 < 2n + 1 < 7$
- ;
- $\{n \mid 2 < n < 3\}$

14. A number minus one is at most nine, or two times the number is at least twenty-four.
-
- $n - 1 \leq 9$
- or
- $2n \geq 24$
- ;
- $\{n \mid n \leq 10 \text{ or } n \geq 12\}$

METEOROLOGY For Exercises 15 and 16, use the following information.Strong winds called the prevailing westerlies blow from west to east in a belt from 40° to 60° latitude in both the Northern and Southern Hemispheres.

15. Write an inequality to represent the latitude of the prevailing westerlies.
-
- $\{w \mid 40 \leq w \leq 60\}$

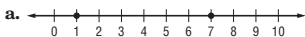
16. Write an inequality to represent the latitudes where the prevailing westerlies are not located.
- $\{w \mid w < 40 \text{ or } w > 60\}$

- 17.
- NUTRITION**
- A cookie contains 9 grams of fat. If you eat no fewer than 4 and no more than 7 cookies, how many grams of fat will you consume?
- between 36 g and 63 g inclusive**

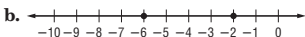
6-5 Practice*Solving Open Sentences Involving Absolute Value*

Match each open sentence with the graph of its solution set.

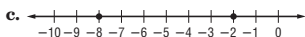
1. $|x + 5| = 3$ **c**



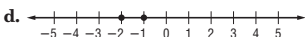
2. $|x + 4| = 2$ **b**



3. $|2x + 3| = 1$ **d**



4. $|4 - x| = 3$ **a**



Express each statement using an inequality involving absolute value.

5. The weather forecast predicted temperatures within 2 degrees of 65°F.

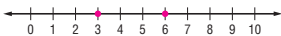
$|t - 65| = 2$

6. A football team has only varied 7 points from their average score of 21 points per game.

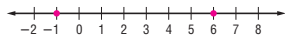
$|p - 21| = 7$

Solve each open sentence. Then graph the solution set.

7. $|2k - 9| = 3$ **{3, 6}**



8. $|5 - 2t| = 7$ **{-1, 6}**



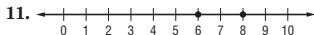
9. $|3r + 9| = 6$ **{-5, -1}**



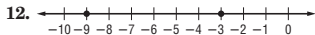
10. $|2m - 11| = 1$ **{5, 6}**



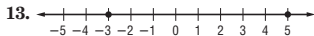
For each graph, write an open sentence involving absolute value.



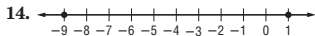
$|x - 7| = 1$



$|x + 6| = 3$



$|x - 1| = 4$



$|x + 4| = 5$

- 15.
- ELECTION**
- A candidate won an election with 58% of the popular vote. If the margin of error was 3.5%, what were the highest and lowest percentages of votes the candidate could have received?
- {54.5%, 61.5%}**

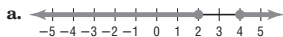
- 16.
- BLOOD**
- The pH is the measure of the acidity of a solution. The normal pH for human blood is 7.3. If the pH varies more than 0.1, health problems may begin to occur. What are the highest and lowest healthy pH levels for human blood?
- {7.2, 7.4}**

6-6 Practice

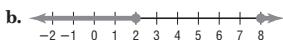
Solving Inequalities Involving Absolute Value

Match each open sentence with the graph of its solution set.

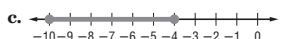
1. $|x + 7| \leq 3$ **c**



2. $|x - 3| \geq 1$ **a**



3. $|2x + 1| < 5$ **d**



4. $|5 - x| \geq 3$ **b**



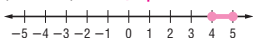
Express each statement using an inequality involving absolute value. Do *not* solve.

5. The height of the plant must be within 2 inches of the standard 13-inch show size.
 $|h - 13| \leq 2$

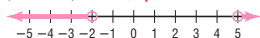
6. The majority of grades in Sean's English class are within 4 points of 85.
 $|g - 85| \leq 4$

Solve each open sentence. Then graph the solution set.

7. $|2z - 9| \leq 1$ $\{z \mid 4 \leq z \leq 5\}$



8. $|3 - 2r| > 7$ $\{r \mid r < -2 \text{ or } r > 5\}$



9. $|3t + 6| < 9$ $\{t \mid -5 < t < 1\}$



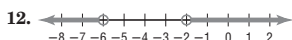
10. $|2g - 5| \geq 9$ $\{g \mid g \leq -2 \text{ or } g \geq 7\}$



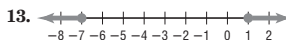
For each graph, write an open sentence involving absolute value.



11. $|x - 6| < 5$



12. $|x + 4| > 2$



13. $|x + 3| \geq 4$



14. $|x - 2| \leq 4$

15. **FITNESS** Taisha uses the elliptical cross-trainer at the gym. Her general goal is to burn 280 Calories per workout, but she varies by as much as 25 Calories from this amount on any given day. What is the range of the number of Calories burned for Taisha's cross-trainer workout? $\{c \mid 255 \leq c \leq 305\}$

16. **TEMPERATURE** A thermometer is guaranteed to give a temperature no more than 1.2°F from the actual temperature. If the thermometer reads 28°F , what is the range for the actual temperature? $\{t \mid 26.8 \leq t \leq 29.2\}$

6-7 Practice*Graphing Inequalities in Two Variables*

Determine which ordered pairs are part of the solution set for each inequality.

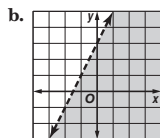
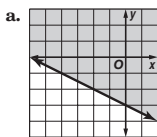
1. $3x + y \geq 6$, $\{(4, 3), (-2, 4), (-5, -3), (3, -3)\}$ **$\{(4, 3), (3, -3)\}$**

2. $y \geq x + 3$, $\{(6, 3), (-3, 2), (3, -2), (4, 3)\}$ **$\{(-3, 2)\}$**

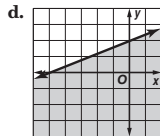
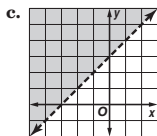
3. $3x - 2y < 5$, $\{(4, -4), (3, 5), (5, 2), (-3, 4)\}$ **$\{(3, 5), (-3, 4)\}$**

Match each inequality with its graph.

4. $5y - 2x \leq 10$ **d**



5. $3y > 3x + 9$ **c**

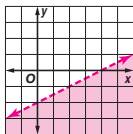


6. $y - 2x < 3$ **b**

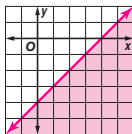
7. $x + 2y \geq -6$ **a**

Graph each inequality.

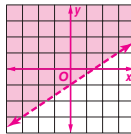
8. $2y - x < -4$



9. $2x - 2y \geq 8$



10. $3y > 2x - 3$



11. **MOVING** A moving van has an interior height of 7 feet (84 inches). You have boxes in 12 inch and 15 inch heights, and want to stack them as high as possible to fit. Write an inequality that represents this situation. **$12x + 15y \leq 84$**

BUDGETING For Exercises 12 and 13, use the following information.

Satchi found a used bookstore that sells pre-owned videos and CDs. Videos cost \$9 each, and CDs cost \$7 each. Satchi can spend no more than \$35.

12. Write an inequality that represents this situation. **$9x + 7y \leq 35$**

13. Does Satchi have enough money to buy 2 videos and 3 CDs?

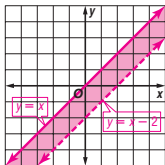
No, the purchases will be \$39, which is greater than \$35.

6-8 Practice

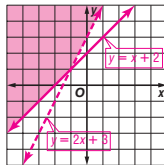
Graphing Systems of Inequalities

Solve each system of inequalities by graphing.

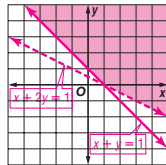
1. $y > x - 2$
 $y \leq x$



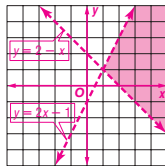
2. $y \geq x + 2$
 $y > 2x + 3$



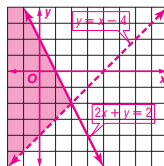
3. $x + y \geq 1$
 $x + 2y > 1$



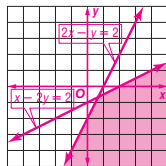
4. $y < 2x - 1$
 $y > 2 - x$



5. $y > x - 4$
 $2x + y \leq 2$



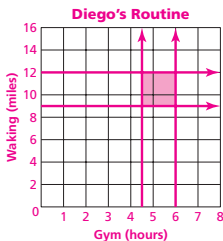
6. $2x - y \geq 2$
 $x - 2y \geq 2$



FITNESS For Exercises 7 and 8, use the following information.

Diego started an exercise program in which each week he works out at the gym between 4.5 and 6 hours and walks between 9 and 12 miles.

- Make a graph to show the number of hours Diego works out at the gym and the number of miles he walks per week.
- List three possible combinations of working out and walking that meet Diego's goals. **Sample answers:**
gym 5 h, walk 9 mi; gym 6 h, walk 10 mi,
gym 5.5 h, walk 11 mi



SOUVENIRS For Exercises 9 and 10, use the following information.

Emily wants to buy turquoise stones on her trip to New Mexico to give to at least 4 of her friends. The gift shop sells stones for either \$4 or \$6 per stone. Emily has no more than \$30 to spend.

- Make a graph showing the numbers of each price of stone Emily can purchase.
- List three possible solutions. **Sample answer: one \$4 stone and four \$6 stones; three \$4 stones and three \$6 stones; five \$4 stones and one \$6 stone**

