Write an equation for the line through the given points or through the given point with the given slope.

1. $(5, 7), (6, 8)$
2. $(-2, 3); \text{ slope } = -1$
3. $(1, 2), (3, 8)$
4. $(-2, 3); \text{ slope } = 4$
5. $(4, 7); \text{ slope } = \frac{3}{2}$
6. $(6, -2); \text{ slope } = -\frac{4}{3}$
7. $(0, 5), (-3, 2)$
8. $(8, 11), (6, 16)$
Skill: Solving Inequalities

Determine whether each number is a solution of the given inequality.

1. \( x \leq -8 \)
   a. \(-10\)
   b. \(6\)
   c. \(-8\)

2. \(-1 > x\)
   a. \(0\)
   b. \(-3\)
   c. \(-6\)

3. \(w < \frac{18}{7}\)
   a. \(5\)
   b. \(-2\)
   c. \(3\frac{1}{2}\)

4. \(0.65 \geq y\)
   a. \(0.43\)
   b. \(-0.65\)
   c. \(0.56\)

5. \(2y + 1 > -5\)
   a. \(-4\)
   b. \(-2\)
   c. \(4\)

6. \(7x - 14 \leq 6x - 16\)
   a. \(0\)
   b. \(-4\)
   c. \(2\)

7. \(n(n - 6) \geq -4\)
   a. \(3\)
   b. \(-2\)
   c. \(5\)

Write an inequality for each situation.

8. Everyone in the class is under 13 years old. Let \(x\) be the age of a person in the class.

9. The speed limit is 60 miles per hour. Let \(s\) be the speed of a car driving within the limit.

10. You have $4.50 to spend on lunch. Let \(c\) be the cost of your lunch.
### Skill: Identifying Inverse Variation

**Investigation 3**

**Thinking With Mathematical Models**

Tell whether the relationship between \( x \) and \( y \) is an inverse variation. If it is, write an equation for the relationship.

1. \[
\begin{array}{c|c|c|c}
  x & 1 & 7 & 14 \\
  y & 70 & 10 & 5 \\
\end{array}
\]

2. \[
\begin{array}{c|c|c|c}
  x & 2 & 3 & 4 \\
  y & 24 & 16 & 12 \\
\end{array}
\]

3. \[
\begin{array}{c|c|c|c}
  x & 5 & 6 & 7 \\
  y & 55 & 66 & 77 \\
\end{array}
\]

4. \[
\begin{array}{c|c|c|c}
  x & 2 & 4 & 8 \\
  y & 9 & 18 & 36 \\
\end{array}
\]

5. \[
\begin{array}{c|c|c|c}
  x & 2 & 3 & 4 \\
  y & 18 & 12 & 9 \\
\end{array}
\]

6. \[
\begin{array}{c|c|c|c}
  x & 1 & 2 & 3 \\
  y & 6 & 3 & 2 \\
\end{array}
\]
Practice 6-1
Rate of Change and Slope

Find the slope of each line.

1. \[ \begin{array}{c}
\begin{array}{c}
\text{Graph of a line with points (2,3), (4,5)}
\end{array}
\end{array} \]
2. \[ \begin{array}{c}
\begin{array}{c}
\text{Graph of a line with points (-2,3), (4,1)}
\end{array}
\end{array} \]
3. \[ \begin{array}{c}
\begin{array}{c}
\text{Graph of a line with points (3,1), (2,3)}
\end{array}
\end{array} \]
4. \[ \begin{array}{c}
\begin{array}{c}
\text{Graph of a line with points (1,2), (3,4)}
\end{array}
\end{array} \]
5. \[ \begin{array}{c}
\begin{array}{c}
\text{Graph of a line with points (2,4), (6,7)}
\end{array}
\end{array} \]
6. \[ \begin{array}{c}
\begin{array}{c}
\text{Graph of a line with points (3,2), (8,4)}
\end{array}
\end{array} \]

Find the slope of the line that passes through each pair of points.
7. \((1, 2), (4, 3)\)
8. \((7, 2), (3, 5)\)
9. \((0, 2), (4, 6)\)
10. \((-2, 5), (3, -4)\)
11. \((2, 4), (6, 7)\)
12. \((-2, -5), (4, 5)\)
13. \((-3, -2), (4, -2)\)
14. \((4, -2), (4, 9)\)
15. \((5, 2), (8, -4)\)

Find the rate of change. Explain what the rate of change means for each situation.

16. Points Scored for 3-point Baskets

17. Distance Sound Travels in Air

18. Speed

Find the slope of the line that passes through each pair of points.
19. \((0, 0), (3, 7)\)
20. \((-2, 4), (4, -1)\)
21. \((-3, 6), (1, -2)\)
22. \((2, 4), (4, -4)\)
23. \((2, -10), (5, -6)\)
24. \((5, 1), (11, 1)\)
25. \((3, 7), (3, 5)\)
26. \((7, 9), (2, 9)\)
27. \((-5, -2), (-5, 3)\)
Skill: Writing Equations of Lines
1. \( y - 8 = x - 6 \)
2. \( y - 3 = -1(x + 2) \)
3. \( y - 3 = 3(x - 3) \)
4. \( y - 3 = 4(x + 2) \)
5. \( y - 7 = \frac{2}{3}(x - 4) \)
6. \( y + 2 = -\frac{4}{3}(x - 6) \)
7. \( y - 2 = x + 3 \)
8. \( y - 16 = -\frac{5}{2}(x - 6) \)

Skill: Solving Inequalities
1. a. yes    b. no    c. yes
2. a. no    b. yes    c. yes
3. a. no    b. yes    c. no
4. a. yes    b. yes    c. yes
5. a. no    b. yes    c. yes
6. a. no    b. yes    c. no
7. a. no    b. yes    c. no
8. \( x < 13 \)   9. \( s \leq 60 \)   10. \( c \leq $4.50 \)

Skill: Identifying Inverse Variation
1. Inverse variation; \( xy = 70 \)
2. Inverse variation; \( xy = 48 \)
3. Direct variation; \( y = 11x \)
4. Direct variation; \( y = 4.5x \)
5. Inverse variation; \( xy = 36 \)
6. Inverse variation; \( xy = 6 \)
SKILL: WRITING EQUATIONS OF LINES

1. \( y = x + 2 \)
2. \( y = -x + 1 \)
3. \( y = 3x - 1 \)
4. \( y = 4x + 11 \)
5. \( y = 1.5x + 1 \)
6. \( y = -1.3x + 6 \)
7. \( y = x + 5 \)
8. \( y = -2.5x + 31 \)
Chapter 6 Answers

Practice 6-1
1. \(\frac{5}{3}\) 2. \(-2\) 3. \(-\frac{2}{3}\) 4. 3 5. \(\frac{3}{2}\) 6. \(\frac{4}{3}\) 7. \(\frac{1}{3}\) 8. \(-\frac{3}{4}\) 9. 1 10. \(-\frac{9}{5}\) 11. \(\frac{3}{4}\) 12. \(\frac{5}{3}\) 13. 0 14. undefined 15. \(-2\) 16. 3; point score increases by 3 for each 3-point basket. 17. \(\frac{1}{5}\); sound travels 1 mi for each 5 s. 18. \(-16\); the speed decreases 16 ft/s every second. 19. \(\frac{7}{3}\) 20. \(-\frac{5}{6}\) 21. \(-2\) 22. \(-4\) 23. \(\frac{4}{3}\) 24. 0 25. undefined 26. 0 27. undefined

Practice 6-2
1. \(1; 2\) 2. \(-\frac{1}{3}; -3\)

3. \(2; -1\) 4. \(\frac{3}{5}; -1\)

5. \(\frac{1}{2}; -4\) 6. \(2; -3\)

7. \(\frac{2}{5}; 3\) 8. \(-\frac{1}{3}; -2\)

9. \(-1; -2\) 10. \(-2; 6\)

11. \(-5; -2\) 12. \(-1; 0\)

13. \(2; -4\) 14. \(-5; 5\)

15. \(1; -4\) 16. \(-4; 0\)