In each of Exercises 1–6 plot the points A and B and find the slope of the line through A and B.

[07-02-20-MN-8]

1 $A(-4, 6)$, $B(-1, 18)$

2 $A(6, -2)$, $B(-3, 5)$

3 $A(\frac{2}{3}, \frac{1}{2})$, $B(2, 1)$

4 $A(\sqrt{8}, \sqrt{12})$, $B(-\sqrt{2}, -\sqrt{27})$

5 $A(-1, -3)$, $B(-1, 2)$

6 $A(-3, 4)$, $B(2, 4)$

7 Use slopes to show that $A(-3, 1)$, $B(5, 3)$, $C(3, 0)$, and $D(-5, -2)$ are vertices of a parallelogram.

8 Use slopes to show that $A(1, -3)$, $B(-3, -11)$, and $C(3, 1)$ lie on a straight line.

In each of Exercises 9–20 find an equation for the line satisfying the given conditions.

9 Through $A(2, -6)$; slope $\frac{1}{2}$

10 Slope -3; y-intercept 5

11 Through $A(-5, -7)$ and $B(3, -4)$

12 x-intercept -4; y-intercept 8

13 Through $A(8, -2)$; y-intercept -3

14 Slope 6; x-intercept -2

15 Through $A(10, -6)$ parallel to the **a** x-axis. **b** y-axis

16 Through $A(-5, 1)$ perpendicular to the **a** y-axis, **b** x-axis

17 Bisecting the second and fourth quadrants

18 Coinciding with the y-axis

19 Through $A(-7, 2)$, parallel to the line through $B(0, 4)$ and $C(-6, -6)$

20 Through $P(-3/4, -1/2)$, parallel to the line with equation $x + 3y = 1$

In each of Exercises 21–28 use the slope-intercept form to find the slope and y-intercept of the line with the given equation and sketch the graph.

21 $3x - 4y + 8 = 0$

22 $2y - 5x = 1$

23 $x + 2y = 0$

24 $8x = 1 - 4y$

25 $y = 4$

26 $x + 2 = (\frac{1}{2})y$

27 $5x + 4y = 20$

28 $y = 0$

The following are more challenging

37 If a line l has nonzero x- and y-intercepts a and b, respectively, prove that an equation for l is

$$\frac{x}{a} + \frac{y}{b} = 1.$$

(This is called the **intercept form** for the equation of a line.) Express the equation $4x - 3y = 8$ in intercept form.

38 Prove that an equation of the line through $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$ is

$$(y - y_1)(x_2 - x_1) = (y_2 - y_1)(x - x_1).$$

(This is called the **two-point form** for the equation of a line). Use the two-point form to find an equation of the line through $A(4, -5)$ and $B(-1, 1)$.

39 Find all values of r such that the slope of the line through the points $(r, 4)$ and $(1, 3 - 2r)$ is less than 5.

40 Find all values of t such that the slope of the line through $(t, 3t + 1)$ and $(1 - 2t, t)$ is greater than 4.

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1 4. **3** $\frac{3}{8}$. **5** No slope.
7 Slope AB = slope CD; slope AD = slope BC. **9** $x - 2y - 14 = 0$.
11 $3x - 8y - 41 = 0$. **13** $x - 8y - 24 = 0$.
15 **(a)** $y = -6$. **(b)** $x = 10$. **17** $x + y = 0$. **19** $5x - 3y + 41 = 0$.
21 $\frac{3}{4}$; 2. **23** $-\frac{1}{2}$, 0. **25** 0, 4. **27** $-\frac{5}{4}$, 5.