4-4 Parallel and Perpendicular Lines

Write an equation in slope-intercept form for the line that passes through the given point and is parallel to the graph of given equation.

12. $(4, -3)$, $y = 3x - 5$

14. $(-4, 2)$, $y = -\frac{1}{2}x + 6$

Write an equation in slope-intercept form for the line that passes through the given point and is perpendicular to the graph of the equation.

26. $(2, 6)$, $y = -\frac{1}{4}x + 3$

28. $(4, -2)$, $y = 3x + 5$

Write an equation in slope-intercept form for a line perpendicular to the graph of the equation that passes through the *x*-intercept of that line.

30. $y = \frac{2}{3}x - 6$

32. Write an equation in slope-intercept form for the line that is perpendicular to the graph of $3x + 2y = 8$ and passes through the y-intercept of that line.

Determine whether the graphs of each pair of equations are *parallel*, *perpendicular*, or *neither*.

36. $-3x + 4y = 8$
$-4x + 3y = -6$

38. $2x + 7y = -35$
$4x + 14y = -42$

40. **EXCAVATION** Scientists excavating a dinosaur mapped the site on a coordinate plane. If one bone lies from (−5, 8) to (10, −1) and a second bone lies from (−10, −3) to (−5, −6), are the bones parallel? Explain.

44. **PROBLEM SOLVING** If the line through (−2, 4) and (5, d) is parallel to the graph of $y = 3x + 4$, what is the value of d?

50. A point and a line are shown below.
$(1, 3); y = -\frac{1}{3}x + 5$
Which of the following equations passes through the point and is perpendicular to the line?
F $y = -\frac{1}{3}x + 3\frac{1}{3}$
G $y = 3x + 6$
H $y = -\frac{1}{3}x + 2\frac{2}{3}$
J $y = 3x$

52. Which of the following is the equation of a line in slope-intercept form that passes through (3, –5) and is parallel to the graph of $2x - y = 8$?
F $y = 2x + 13$
G $y = -\frac{1}{2}x - \frac{7}{2}$
H $y = 2x - 11$
I $y = -\frac{1}{2}x$