

46. **REASONING** Write an equation of the line that passes through (3, 4) and satisfies the given condition.
- Parallel to $y = -2$
 - Perpendicular to $y = -2$
 - Parallel to $x = -2$
 - Perpendicular to $x = -2$
47. **TEXAS TAKS REASONING** Write an equation of a line ℓ such that ℓ and the lines $y = -3x + 5$ and $y = 2x + 1$ form a right triangle.
48. **REASONING** Consider two distinct nonvertical lines $A_1x + B_1y = C_1$ and $A_2x + B_2y = C_2$. Show that the following statements are true.
- If the lines are parallel, then $A_1B_2 = A_2B_1$.
 - If the lines are perpendicular, then $A_1A_2 + B_1B_2 = 0$.
49. **CHALLENGE** Show that an equation of the line with x -intercept a and y -intercept b is $\frac{x}{a} + \frac{y}{b} = 1$. This is the *intercept form* of a linear equation.

PROBLEM SOLVING

EXAMPLE 5

on p. 100
for Exs. 50–51

50. **CAR EXPENSES** You buy a used car for \$6500. The monthly cost of owning the car (including insurance, fuel, maintenance, and taxes) averages \$350. Write an equation that models the total cost of buying and owning the car.

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51. **HOUSING** Since its founding, a volunteer group has restored 50 houses. It plans to restore 15 houses per year in the future. Write an equation that models the total number n of restored houses t years from now.

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EXAMPLE 6

on p. 101
for Exs. 52–54

52. **GARDENING** You have a rectangular plot measuring 16 feet by 25 feet in a community garden. You want to grow tomato plants that each need 8 square feet of space and pepper plants that each need 5 square feet. Write an equation that models how many tomato plants and how many pepper plants you can grow. How many pepper plants can you grow if you grow 15 tomato plants?



53. **SPORTS REASONING** Concert tickets cost \$15 for general admission, but only \$9 with a student ID. Ticket sales total \$4500. Write and graph an equation that models this situation. *Explain* how to use your graph to find how many student tickets were sold if 200 general admission tickets were sold.
54. **MULTI-STEP PROBLEM** A company will lease office space in two buildings. The annual cost is \$21.75 per square foot in the first building and \$17 per square foot in the second. The company has \$86,000 budgeted for rent.
- Write an equation that models the possible amounts of space rented in the buildings.
 - How many square feet of space can be rented in the first building if 2500 square feet are rented in the second?
 - If the company wants to rent equal amounts of space in the buildings, what is the total number of square feet that can be rented?