65. $4y + x = 8$

66. $y + 4x = 8$

67. $y - 2 = 0$

68. $y + 5 = 0$

In each case determine whether the lines are parallel, perpendicular, or neither.

69. $y = 3x - 4$
$y = 3x - 9$

70. $y = -5x + 7$
$y = \frac{1}{5}x - 6$

71. $y = 2x - 1$
$y = -2x + 1$

72. $y = x + 7$
$y = -x + 2$

73. $y = 3$
$y = -\frac{1}{3}$

74. $y = 3x + 2$
$y = \frac{1}{3}x - 4$

75. $y = -4x + 1$
$y = \frac{1}{4}x - 5$

76. $y = \frac{1}{3}x + \frac{1}{2}$
$y = \frac{1}{3}x - 2$

‹4› Writing the Equation for a Line

Write an equation in slope-intercept form, if possible, for each line. See Example 6.

77. The line through $(0, -4)$ with slope $\frac{1}{2}$

78. The line through $(0, 4)$ with slope $-\frac{1}{2}$

79. The line through $(0, 3)$ that is parallel to the line $y = 2x - 1$

80. The line through $(0, -2)$ that is parallel to the line $y = -\frac{1}{3}x + 6$

VIDEO **81.** The line through $(0, 6)$ that is perpendicular to the line $y = 3x - 5$

82. The line through $(0, -1)$ that is perpendicular to the line $y = x$

83. The line with y-intercept $(0, 3)$ that is parallel to the line $2x + y = 5$

84. The line through the origin that is parallel to the line $y - 3x = -3$

85. The line through $(2, 3)$ that runs parallel to the x-axis

86. The line through $(-3, 5)$ that runs parallel to the y-axis

87. The line through $(0, 4)$ that is perpendicular to $2x - 3y = 6$

88. The line through $(0, -1)$ that is perpendicular to $2x - 5y = 10$

89. The line through $(0, 4)$ and $(5, 0)$

90. The line through $(0, -3)$ and $(4, 0)$

‹5› Applications

Solve each problem. See Example 7.

91. ***Labor cost.*** An appliance repair service uses the formula $C = 50n + 80$ to determine the labor cost for a service call, where C is the cost in dollars and n is the number of hours.

a) Find the cost of labor for $n = 0$, 1, and 2 hours.

b) Find the slope and C-intercept for the line $C = 50n + 80$.

c) Interpret the slope and C-intercept.

92. ***Decreasing price.*** World Auto uses the formula $P = -3000n + 17{,}000$ to determine the wholesale price for a used Ford Focus, where P is the price in dollars and n is the age of the car in years.

a) Find the price for a Focus that is 1, 2, or 3 years old.

b) Find the slope and P-intercept for the line $P = -3000n + 17{,}000$.

c) Interpret the slope and P-intercept.

93. ***Marginal cost.*** A manufacturer plans to spend \$150,000 on research and development for a new lawn mower and then \$200 to manufacture each mower. The formula $C = 200n + 150{,}000$ gives the cost in dollars of n mowers. What is the cost of 5000 mowers? What is the cost of 5001

Warm-Ups ▼

True or false? Explain your answer.

1. The formula $y = m(x - x_1)$ is the point-slope form for a line.
2. It is impossible to find the equation of a line through $(2, 5)$ and $(-3, 1)$.
3. The point-slope form will not work for the line through $(3, 4)$ and $(3, 6)$.
4. The equation of the line through the origin with slope 1 is $y = x$.
5. The slope of the line $5x + y = 4$ is 5.
6. The slope of any line perpendicular to the line $y = 4x - 3$ is $-\frac{1}{4}$.
7. The slope of any line parallel to the line $x + y = 1$ is -1.
8. The line $2x - y = -1$ goes through the point $(-2, -3)$.
9. The lines $2x + y = 4$ and $y = -2x + 7$ are parallel.
10. The equation of the line through $(0, 0)$ perpendicular to $y = x$ is $y = -x$.

3.4 Exercises

‹ Study Tips ›

- When taking a test, put a check mark beside every problem that you have answered and checked. Spend any extra time working on unchecked problems.
- Make sure that you don't forget to answer any of the questions on a test.

Reading and Writing *After reading this section, write out the answers to these questions. Use complete sentences.*

1. What is the point-slope form for the equation of a line?
2. For what is the point-slope form used?
3. What is the procedure for finding the equation of a line when given two points on the line?
4. How can you find the slope of a line when given the equation of the line?
5. What is the relationship between the slopes of parallel lines?
6. What is the relationship between the slopes of perpendicular lines?

‹1› Point-Slope Form

Write each equation in slope-intercept form. See Example 1.

7. $x + y = 1$
8. $x - y = 1$
9. $y - 1 = 5(x + 2)$
10. $y + 3 = -3(x - 6)$