CHAPTER 3 REVIEW EXERCISES

Section 3.1

Plot the following sets of points in the Cartesian plane.

1. $\{(7,3),(-2,4),(3,0),(-1,-6)\}$

2. $\{(4,-4),(-6,3),(-3,-1),(-4,2)\}$

3. $\{(2,1),(-4,5),(3,-7),(2,3)\}$

Identify the quadrant in which each point lies, if possible. If a point lies on an axis, specify which part (positive or negative) of which axis (*x* or *y*).

4. $(0,0)$

5. $(1,0)$

6. $(3,-2)$

For each of the following equations, determine the value of the missing entries in the accompanying table of ordered pairs. Then plot the ordered pairs and sketch your guess of the complete graph of the equation.

7. $3x-2y=6$

x	y
?	0
0	?
−1	?
?	−2
−2	?

8. $3x=y^2-4$

x	y
0	?
?	0
?	$-\sqrt{7}$
−1	?
?	3

Determine **a.** the distance between the following pairs of points, and **b.** the midpoint of the line segment joining each pair of points.

9. $(2,-6)$ and $(3,-7)$

10. $(-4,-3)$ and $(4,-9)$

11. $(-3,6)$ and $(-7,0)$

12. $(5,-1)$ and $(-4,3)$

13. Given $A(-4,2)$, $B(x,y)$, and $C(1,-1)$, find $x+y$ if C is the midpoint of the line segment $\overline{AB}$.

Find the perimeter of the triangle whose vertices are the specified points in the plane.

14. $(-3,2)$, $(-3,0)$, and $(-6,-3)$

15. $(8,-3)$, $(2,-3)$, and $(2,5)$

16. Use the distance formula to prove that the triangle with vertices at the points $(-2,2),(0,3)$, and $(4,-5)$ is a right triangle and determine the area of the triangle.

Section 3.2

Find the standard form of the equation for each circle described below.

17. Radius 4; center $\left(\sqrt{5},-\sqrt{2}\right)$

18. Endpoints of a diameter are $(1,-3)$ and $(-5,3)$.

19. Center at $(2,-1)$; passes through $(4,3)$

20. Endpoints of a diameter are $(1,2)$ and $(-5,8)$.

21. What is the radius and center of the circle $(x+3)^2+(y-1)^2=8$?

22. Given that point $(a,4)$ is on the circle $x^2+y^2=25$, find a.

Sketch a graph of the circle defined by the given equation. Then state the radius and center of the circle.

23. $(x+5)^2+(y-2)^2=16$

24. $x^2+(y-3)^2=10$

25. $(x-1)^2+(y+4)^2=9$

26. $x^2+y^2+6x-10y=-5$

Section 3.3

Determine if the following equations are linear.

27. $3x+y(4-2x)=8$

28. $y-3(y-x)=8x$

29. $9x^2-(3x+1)^2=y-3$

30. $8x-3y=4(x-1)+y$

31. $2x(3y-1)=7$

32. $3x^2+2=(x+2)^2-1$

Find the *x*- and *y*-intercepts of the given equations, if possible, and then sketch their graphs.

33. $4y-12=8x$

34. $3(2y+1)=5y-4x+3$

35. $2x+y-2=2(3+x)$

36. $3y-4x=-2(3x-y)$

37. $2x+3y=18$

38. $4x+y=12+y$

Section 3.4

Determine the slope of the line passing through the specified points.

39. $(-2,5)$ and $(-3,-7)$

40. $(3,6)$ and $(7,-10)$

41. $(3,5)$ and $(3,-7)$

Use the slope-intercept form to graph the equations.

42. $6x-3y=9$ **43.** $2y+5x+9=0$ **44.** $15y-5x=0$

Find the equation, in standard form, of the line passing through the given point with the given slope.

45. point $(4,-1)$; slope of 1 **46.** point $(-2,3)$; slope of $\frac{3}{2}$

Find the equation, in slope-intercept form, of the line with the given *y*-intercept and slope.

47. *y*-intercept $(0,-2)$; slope of $\frac{5}{9}$ **48.** *y*-intercept $(0,9)$; slope of $-\frac{7}{3}$

Find the equation, in standard form, of the line passing through the specified points.

49. $(5,7)$ and $(3,-2)$ **50.** $\left(\frac{3}{2},1\right)$ and $\left(-3,\frac{5}{2}\right)$

51. A sales person receives a monthly salary of \$2800 plus a commission of 8% of sales. Write a linear equation for the sales person's monthly wage W, in terms of monthly sales, s.

Section 3.5

Determine if the two lines are perpendicular, parallel, or neither.

52. $x-4y=3$ and $4x-y=2$

53. $3x+y=2$ and $x-3y=25$

54. $\frac{3x-y}{3}=x+2$ and $\frac{y}{3}+x=9$

Find the equation, in slope-intercept form, for the line parallel to the given line and passing through the indicated point.

55. $y-3x=10$; $(-2,4)$ **56.** $3(y+1)=\frac{x-3}{2}$; $(-6,3)$

57. $y=2x+1$; $(1,-1)$ **58.** $3y-2=-5(2x-1)$; $(2,-5)$

Find the equation, in slope-intercept form, for the line perpendicular to the given line and passing through the indicated point.

59. $y=\frac{3}{4}x-1$; $(6,-2)$ **60.** $2(y-3)=\frac{2x+3}{3}$; $(-5,-4)$

61. $y=8$; $(7,1)$ **62.** $5x+7y-2=10$; $\left(\frac{2}{7},-1\right)$

Each set of four ordered pairs defines the vertices, in counterclockwise order, of a quadrilateral. Determine if the quadrilateral is a rectangle.

63. $\{(-2,1),(-1,-1),(3,1),(2,3)\}$ **64.** $\{(-2,2),(-3,-1),(2,-3),(2,1)\}$

Section 3.6

Solve the following linear inequalities by graphing their solution sets.

65. $x - 2y < 4$ **66.** $y < 3x + 2$ **67.** $\frac{4x + y}{3} \geq 2$

Graph the solution sets that satisfy the following inequalities.

68. $7x - 2y \geq 8$ and $y < 5$ **69.** $x - 4y \geq 6$ or $y > -2$

70. $y - x > 0$ and $x < 2$

Graph the solution sets that satisfy the following linear absolute value inequalities.

71. $|2x + 5| < 3$ **72.** $|2x - 1| < 5$

73. $|x - y| < 3$ **74.** $-5 + |x - 3| > -1$

75. $|2x + 1| < 3$ or $|y + 3| \geq 4$ **76.** $|x| > 4$ and $\left|\frac{2y - 1}{3}\right| < 3$

77. A candle store makes a \$3 profit for every novelty candle sold and a \$4 profit for every accompanying candle holder sold. Write a linear inequality describing the number of each type of item that needs to be sold in order to make a total profit of at least \$1500.