

1-2 ■ Two points P and Q are given.

- Plot P and Q on a coordinate plane.
- Find the distance from P to Q .
- Find the midpoint of the segment PQ .
- Sketch the line determined by P and Q , and find its equation in slope-intercept form.
- Sketch the circle that passes through Q and has center P , and find the equation of this circle.

1. $P(2, 0)$, $Q(-5, 12)$ 2. $P(7, -1)$, $Q(2, -11)$

3-4 ■ Sketch the region given by the set.

3. $\{(x, y) \mid -4 < x < 4 \text{ and } -2 < y < 2\}$

4. $\{(x, y) \mid x \geq 4 \text{ or } y \geq 2\}$

5. Which of the points $A(4, 4)$ or $B(5, 3)$ is closer to the point $C(-1, -3)$?

6. Find an equation of the circle that has center $(2, -5)$ and radius $\sqrt{2}$.

7. Find an equation of the circle that has center $(-5, -1)$ and passes through the origin.

8. Find an equation of the circle that contains the points $P(2, 3)$ and $Q(-1, 8)$ and has the midpoint of the segment PQ as its center.

9-12 ■ Determine whether the equation represents a circle, a point, or has no graph. If the equation is that of a circle, find its center and radius.

9. $x^2 + y^2 + 2x - 6y + 9 = 0$

10. $2x^2 + 2y^2 - 2x + 8y = \frac{1}{2}$

11. $x^2 + y^2 + 72 = 12x$

12. $x^2 + y^2 - 6x - 10y + 34 = 0$

13-22 ■ Test the equation for symmetry and sketch its graph.

13. $y = 2 - 3x$

14. $2x - y + 1 = 0$

15. $x + 3y = 21$

16. $x = 2y + 12$

17. $\frac{x}{2} - \frac{y}{7} = 1$

18. $\frac{x}{4} + \frac{y}{5} = 0$

19. $y = 16 - x^2$

20. $8x + y^2 = 0$

21. $x = \sqrt{y}$

22. $y = -\sqrt{1 - x^2}$

23-26 ■ Use a graphing device to graph the equation in an appropriate viewing rectangle.

23. $y = x^2 - 6x$

24. $y = \sqrt{5 - x}$

25. $y = x^3 - 4x^2 - 5x$

26. $\frac{x^2}{4} + y^2 = 1$

27. Find an equation for the line that passes through the points $(-1, -6)$ and $(2, -4)$.

28. Find an equation for the line that passes through the point $(6, -3)$ and has slope $-\frac{1}{2}$.

29. Find an equation for the line that has x -intercept 4 and y -intercept 12.

30. Find an equation for the line that passes through the point $(1, 7)$ and is perpendicular to the line $x - 3y + 16 = 0$.

31. Find an equation for the line that passes through the origin and is parallel to the line $3x + 15y = 22$.

32. Find an equation for the line that passes through the point $(5, 2)$ and is parallel to the line passing through $(-1, -3)$ and $(3, 2)$.

33. Hooke's Law states that if a weight w is attached to a hanging spring, then the stretched length s of the spring is linearly related to w . For a particular spring we have

$$s = 0.3w + 2.5$$

where s is measured in inches and w in pounds.

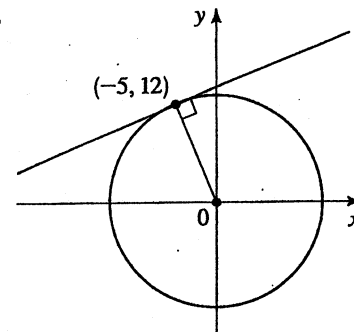
- What do the slope and s -intercept in this equation represent?
- How long is the spring when a 5-lb weight is attached?

34. Margarita is hired by an accounting firm at a salary of \$60,000 per year. Three years later her annual salary has increased to \$70,500. Assume her salary increases linearly.

- Find an equation that relates her annual salary S and the number of years t that she has worked for the firm.
- What do the slope and S -intercept of her salary equation represent?
- What will her salary be after 12 years with the firm?

35-36 ■ Find equations for the circle and the line in the figure.

35.



36.

