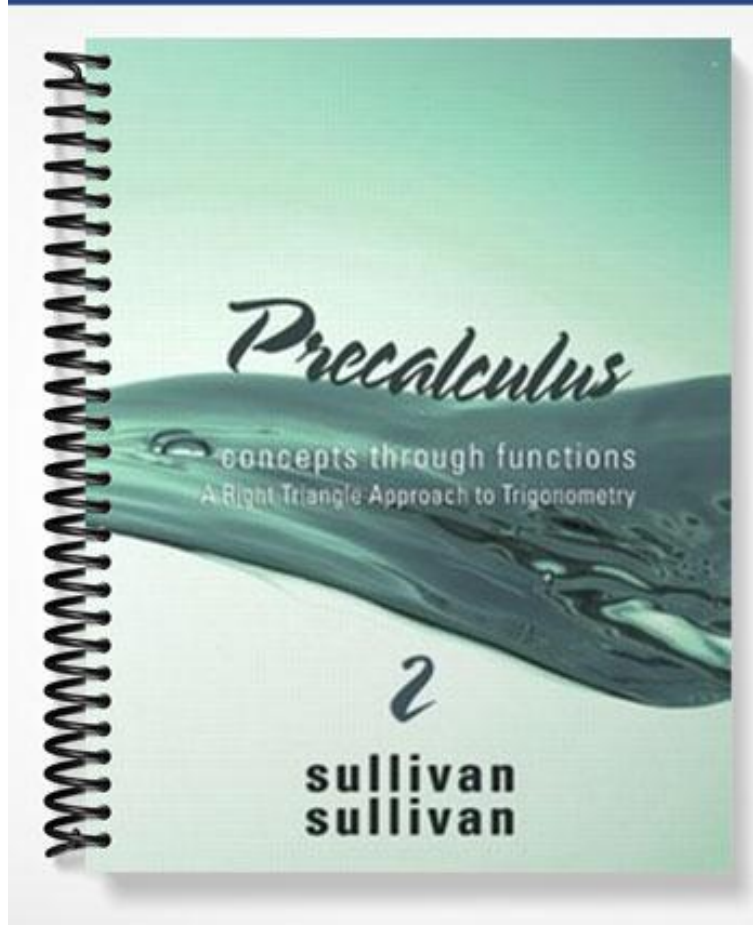


TEST BANK



Ch. 0 Foundations: A Prelude to Functions

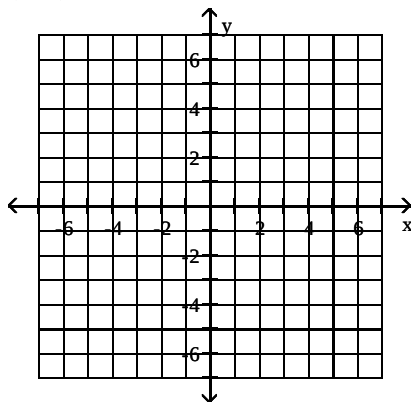
0.1 The Distance and Midpoint Formulas

1 Use the Distance Formula

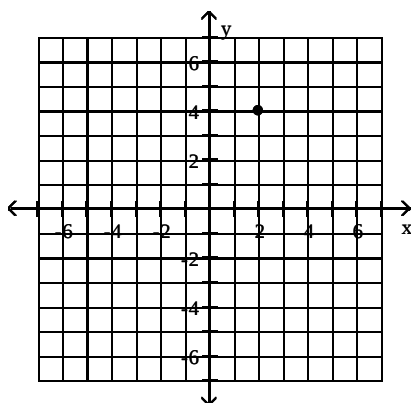
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Plot the point.

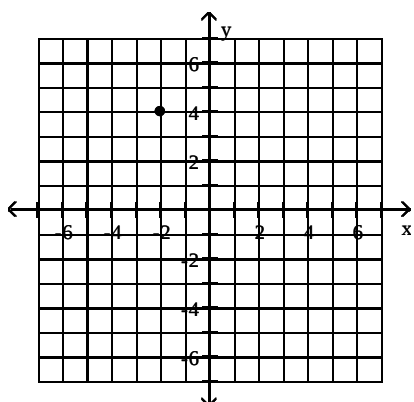
1) $(2, 4)$



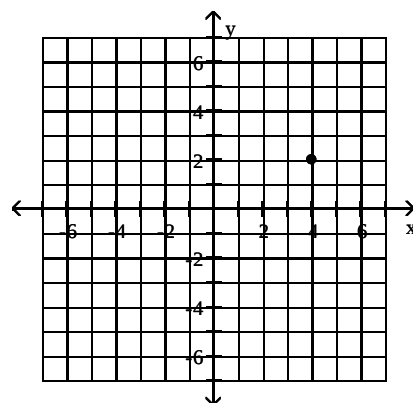
A)



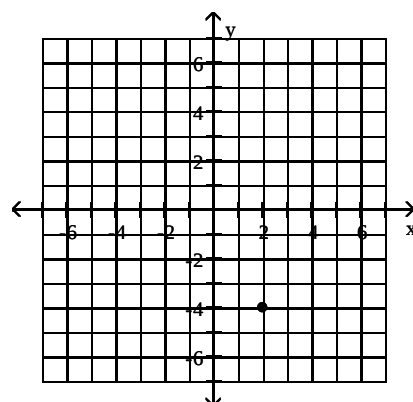
C)



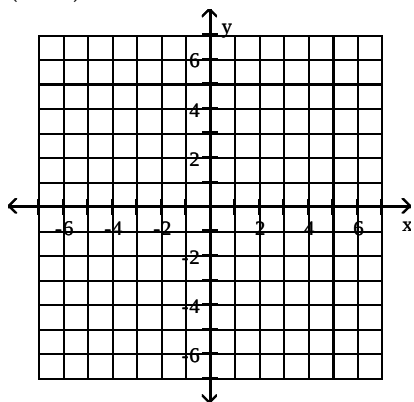
B)



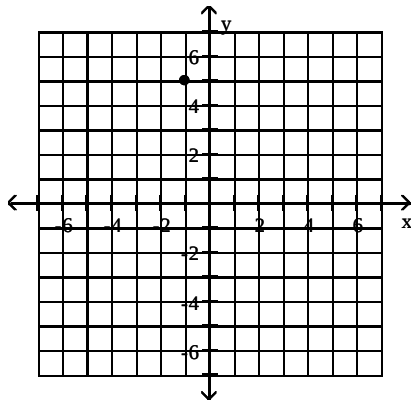
D)



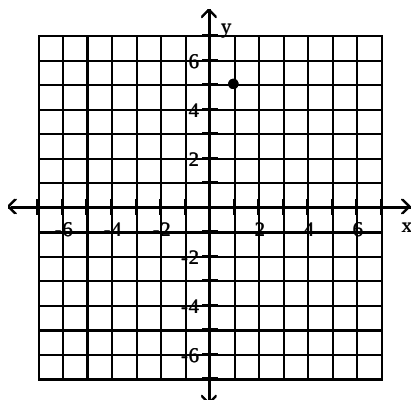
2) $(-1, 5)$



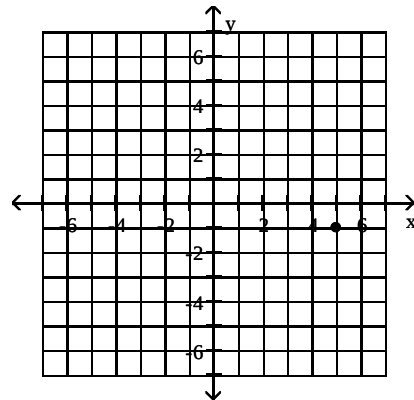
A)



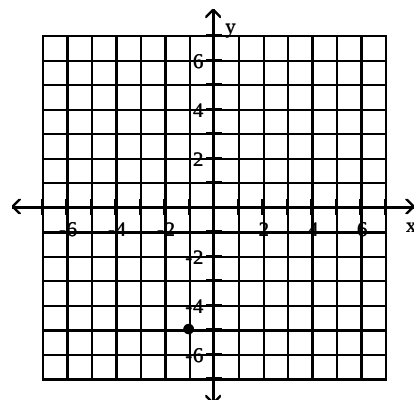
C)



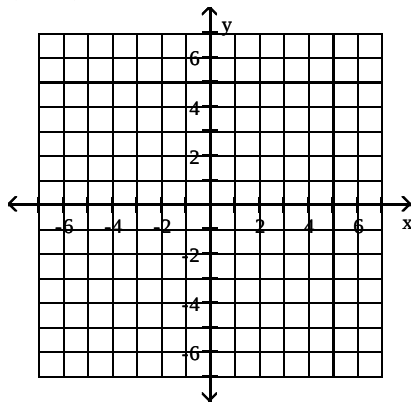
B)



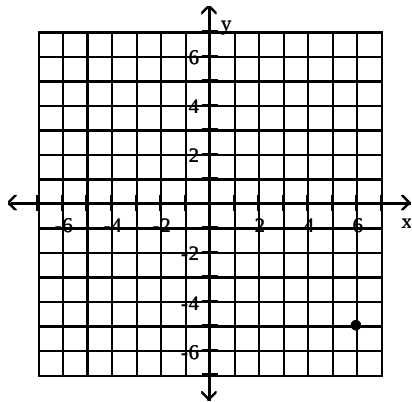
D)



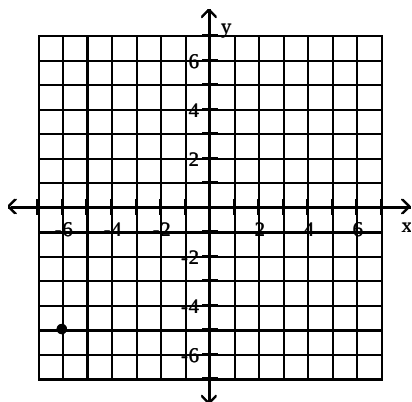
3) $(6, -5)$



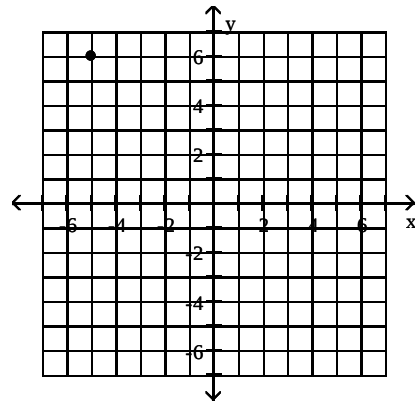
A)



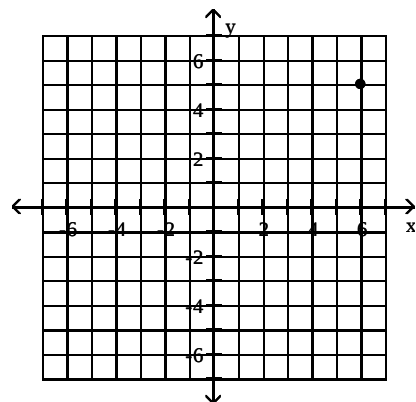
C)



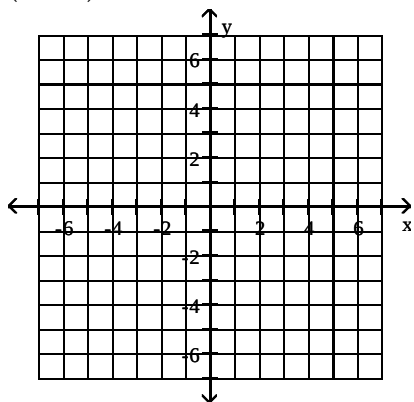
B)



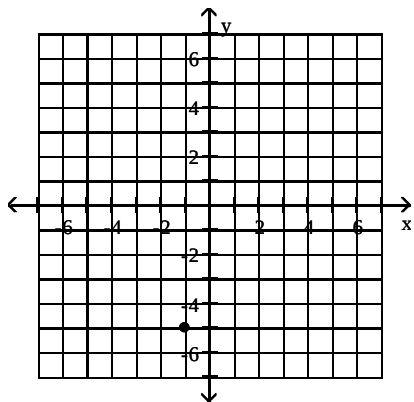
D)



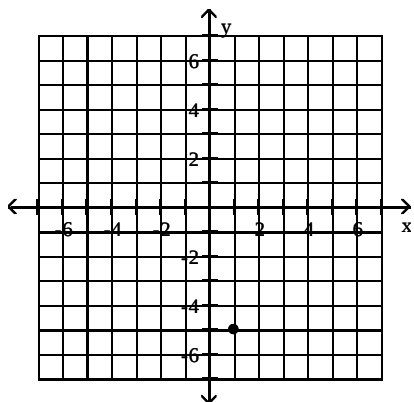
4) $(-1, -5)$



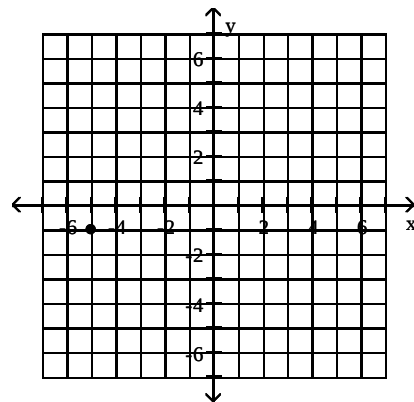
A)



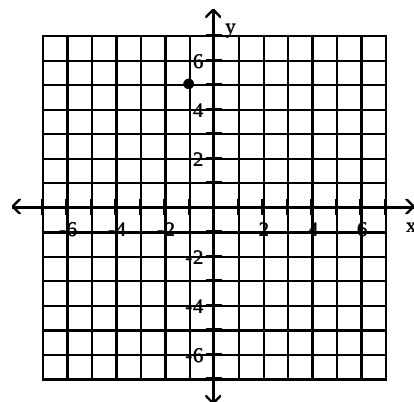
C)



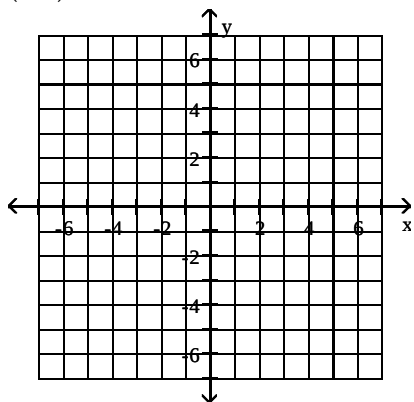
B)



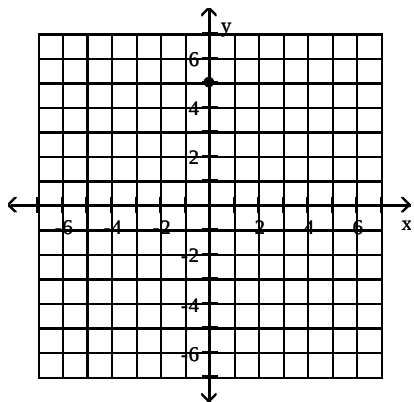
D)



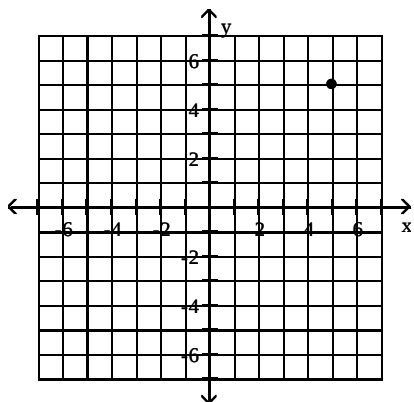
5) $(0, 5)$



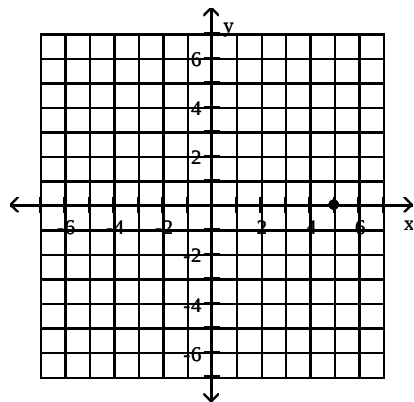
A)



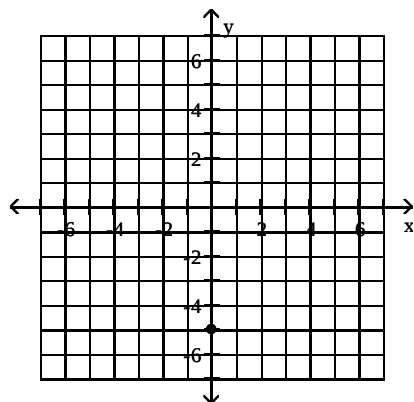
C)



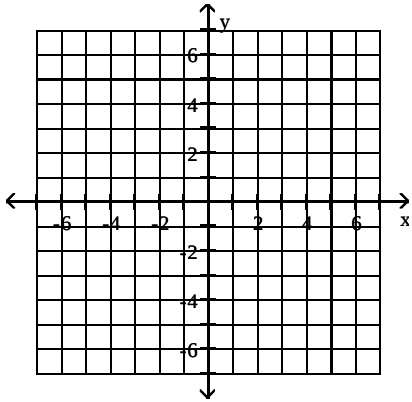
B)



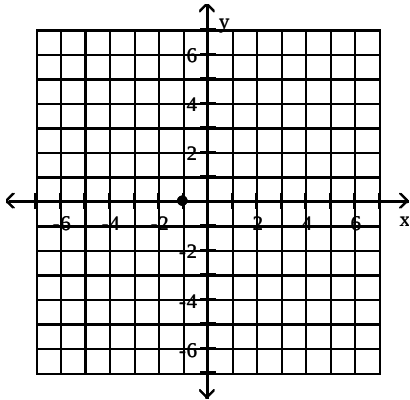
D)



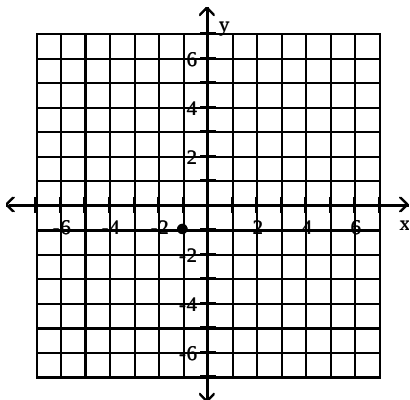
6) $(-1, 0)$



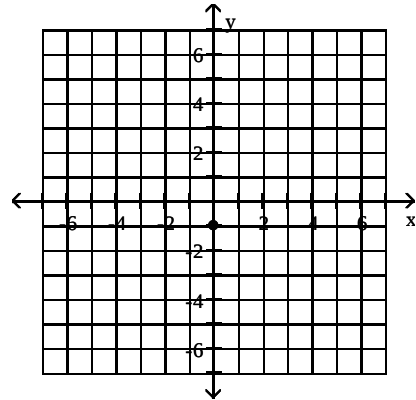
A)



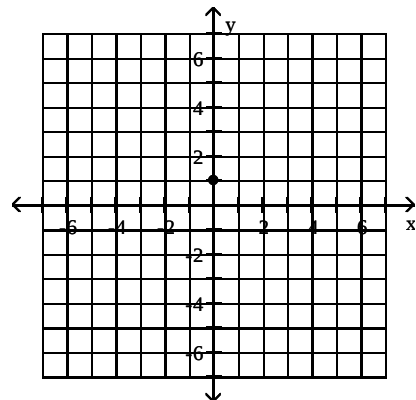
C)



B)



D)



Tell in which quadrant or on what coordinate axis the point lies.

7) $(11, 20)$

A) Quadrant I

B) Quadrant II

C) Quadrant III

D) Quadrant IV

8) $(-12, 16)$

A) Quadrant II

B) Quadrant I

C) Quadrant III

D) Quadrant IV

9) $(-9, -3)$

A) Quadrant III

B) Quadrant I

C) Quadrant II

D) Quadrant IV

10) $(20, -10)$

A) Quadrant IV

B) Quadrant I

C) Quadrant II

D) Quadrant III

11) $(0, 10)$

A) y-axis

B) x-axis

C) Quadrant I

D) Quadrant II

12) (2, 0)

A) x-axis

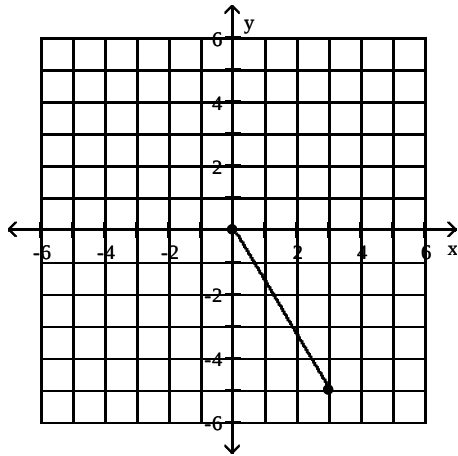
B) y-axis

C) Quadrant I

D) Quadrant II

Find the distance $d(P_1, P_2)$ between the points P_1 and P_2 .

13)



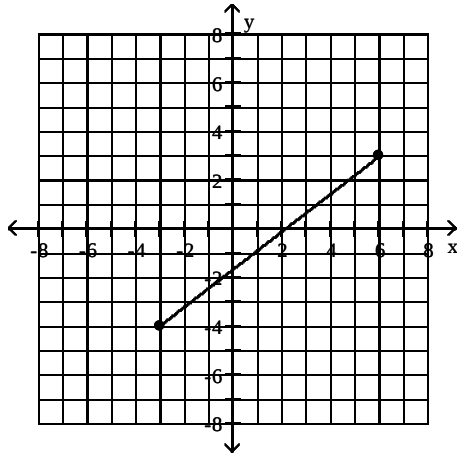
A) $\sqrt{34}$

B) $2\sqrt{2}$

C) 9

D) 7

14)



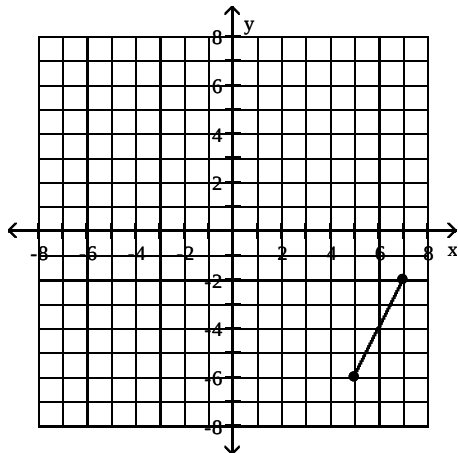
A) $\sqrt{130}$

B) $4\sqrt{2}$

C) 63

D) 2

15)



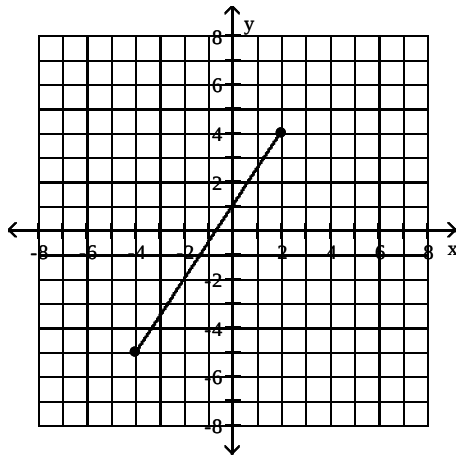
A) $2\sqrt{5}$

B) $12\sqrt{3}$

C) 12

D) 2

16)



A) $3\sqrt{13}$

B) $45\sqrt{5}$

C) 45

D) 3

17) $P_1 = (-1, -1)$; $P_2 = (-1, 5)$

A) 6

B) $\sqrt{6}$

C) 7

D) 5

18) $P_1 = (4, 2)$; $P_2 = (0, 5)$

A) 5

B) 25

C) 6

D) 10

19) $P_1 = (0, 2)$; $P_2 = (-7, 2)$

A) 7

B) 2

C) $\sqrt{53}$

D) 49

20) $P_1 = (0, 0)$; $P_2 = (2, -4)$

A) $2\sqrt{5}$

B) 20

C) 2

D) $\sqrt{6}$

21) $P_1 = (3, 4)$; $P_2 = (-7, -7)$

A) $\sqrt{221}$

B) $\sqrt{21}$

C) 110

D) 1

22) $P_1 = (3, -7)$; $P_2 = (5, -3)$

A) $2\sqrt{5}$

B) $12\sqrt{3}$

C) 12

D) 2

23) $P_1 = (-1, -3)$; $P_2 = (5, -7)$

A) $2\sqrt{13}$

B) $20\sqrt{5}$

C) 20

D) 10

24) $P_1 = (-0.3, -0.1)$; $P_2 = (-2, -1.4)$ Round to three decimal places, if necessary.

A) 2.14

B) 15

C) 6.768

D) 2.24

Decide whether or not the points are the vertices of a right triangle.

25) $(3, -5)$, $(9, -5)$, $(9, 0)$

A) Yes

B) No

26) $(-4, 0)$, $(-2, 4)$, $(0, 3)$

A) Yes

B) No

27) $(1, -4)$, $(7, -2)$, $(6, -7)$

A) No

B) Yes

28) $(3, -5)$, $(9, -3)$, $(15, -10)$

A) No

B) Yes

Solve the problem.

29) Find all values of k so that the given points are $\sqrt{29}$ units apart.

$(-5, 5), (k, 0)$

A) $-3, -7$

B) -7

C) $3, 7$

D) 7

30) Find the area of the right triangle ABC with $A = (-2, 7), B = (7, -1), C = (3, 9)$.

A) 29 square units

B) 58 square units

C) $\frac{\sqrt{58}}{2}$ square units

D) $\frac{\sqrt{29}}{2}$ square units

31) Find all the points having an x -coordinate of 9 whose distance from the point $(3, -2)$ is 10.

A) $(9, 6), (9, -10)$

B) $(9, 2), (9, -4)$

C) $(9, -12), (9, 8)$

D) $(9, 13), (9, -7)$

32) A middle school's baseball playing field is a square, 70 feet on a side. How far is it directly from home plate to second base (the diagonal of the square)? If necessary, round to the nearest foot.

A) 99 feet

B) 100 feet

C) 98 feet

D) 106 feet

33) A motorcycle and a car leave an intersection at the same time. The motorcycle heads north at an average speed of 20 miles per hour, while the car heads east at an average speed of 48 miles per hour. Find an expression for their distance apart in miles at the end of t hours.

A) $52t$ miles

B) $t\sqrt{68}$ miles

C) $52\sqrt{t}$ miles

D) $2t\sqrt{13}$ miles

34) Find the length of each side of the triangle determined by the three points P_1, P_2 , and P_3 . State whether the triangle is an isosceles triangle, a right triangle, neither of these, or both.

$P_1 = (-5, -4), P_2 = (-3, 4), P_3 = (0, -1)$

A) $d(P_1, P_2) = 2\sqrt{17}; d(P_2, P_3) = \sqrt{34}; d(P_1, P_3) = \sqrt{34}$
both

B) $d(P_1, P_2) = 2\sqrt{17}; d(P_2, P_3) = \sqrt{34}; d(P_1, P_3) = \sqrt{34}$
isosceles triangle

C) $d(P_1, P_2) = 2\sqrt{17}; d(P_2, P_3) = \sqrt{34}; d(P_1, P_3) = 5\sqrt{2}$
right triangle

D) $d(P_1, P_2) = 2\sqrt{17}; d(P_2, P_3) = \sqrt{34}; d(P_1, P_3) = 5\sqrt{2}$
neither

2 Use the Midpoint Formula

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the midpoint of the line segment joining the points P_1 and P_2 .

35) $P_1 = (4, 5); P_2 = (1, 2)$

A) $(\frac{5}{2}, \frac{7}{2})$

B) $(5, 7)$

C) $(3, 3)$

D) $(\frac{7}{2}, \frac{5}{2})$

36) $P_1 = (-2, 1); P_2 = (-6, 3)$

A) $(-4, 2)$

B) $(2, -1)$

C) $(4, -2)$

D) $(-8, 4)$

37) $P_1 = (7, 1); P_2 = (-16, -16)$

A) $(-\frac{9}{2}, -\frac{15}{2})$

B) $(\frac{23}{2}, \frac{17}{2})$

C) $(-9, -15)$

D) $(9, 15)$

38) $P_1 = (-0.6, 0.2); P_2 = (-1.8, 2.7)$

A) $(-1.2, 1.45)$

B) $(1.45, -1.2)$

C) $(-0.6, 1.25)$

D) $(1.25, -0.6)$

39) $P_1 = (b, 2)$; $P_2 = (0, 4)$

A) $\left(\frac{b}{2}, 3\right)$

B) $(b, 6)$

C) $\left(-\frac{b}{2}, 2\right)$

D) $(b, 3)$

40) $P_1 = (4b, 2)$; $P_2 = (5b, 1)$

A) $\left(\frac{9b}{2}, \frac{3}{2}\right)$

B) $(9b, 3)$

C) $(b, 1)$

D) $\left(\frac{3b}{2}, \frac{9}{2}\right)$

Solve the problem.

41) If $(-5, 4)$ is the endpoint of a line segment, and $(-2, 6)$ is its midpoint, find the other endpoint.

A) $(1, 8)$

B) $(1, 2)$

C) $(-11, 0)$

D) $(-1, 10)$

42) If $(4, -3)$ is the endpoint of a line segment, and $(-1, -7)$ is its midpoint, find the other endpoint.

A) $(-6, -11)$

B) $(-6, 1)$

C) $(14, 5)$

D) $(-4, -13)$

43) If $(-4, 3)$ is the endpoint of a line segment, and $(1, 2)$ is its midpoint, find the other endpoint.

A) $(6, 1)$

B) $(6, 4)$

C) $(-14, 5)$

D) $(-6, 13)$

44) If $(4, -4)$ is the endpoint of a line segment, and $(0, -1)$ is its midpoint, find the other endpoint.

A) $(-4, 2)$

B) $(-4, -7)$

C) $(12, -10)$

D) $(10, -12)$

45) The medians of a triangle intersect at a point. The distance from the vertex to the point is exactly two-thirds of the distance from the vertex to the midpoint of the opposite side. Find the exact distance of that point from the vertex $A(3, 4)$ of a triangle, given that the other two vertices are at $(0, 0)$ and $(8, 0)$.

A) $\frac{2\sqrt{17}}{3}$

B) $\frac{\sqrt{17}}{3}$

C) 2

D) $\frac{8}{3}$

0.2 Graphs of Equations in Two Variables; Intercepts; Symmetry

1 Graph Equations by Plotting Points

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Determine whether the given point is on the graph of the equation.

1) Equation: $y = x^4 - \sqrt{x}$

Point: $(-9, 6558)$

A) No

B) Yes

2) Equation: $x^2 + y^2 = 16$

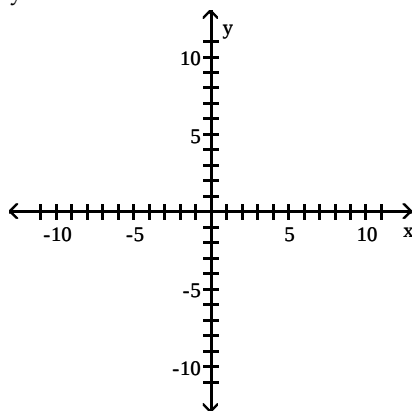
Point: $(0, 4)$

A) Yes

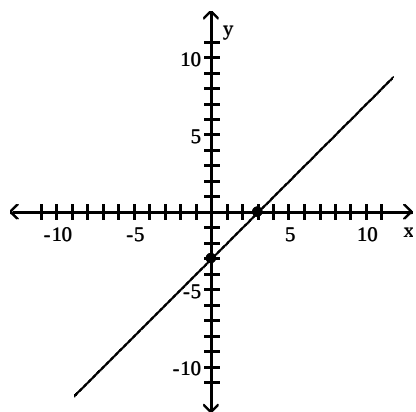
B) No

Graph the equation by plotting points.

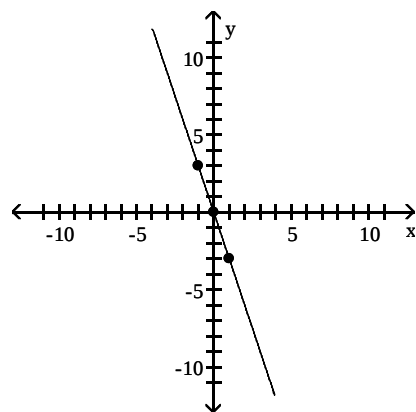
3) $y = x - 3$



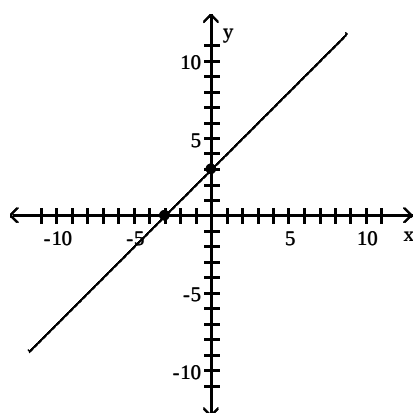
A)



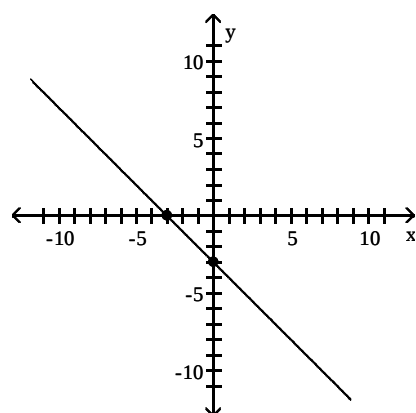
B)



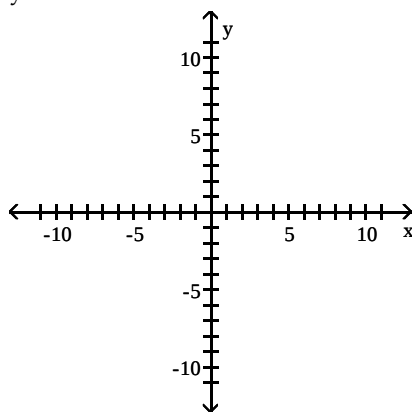
C)



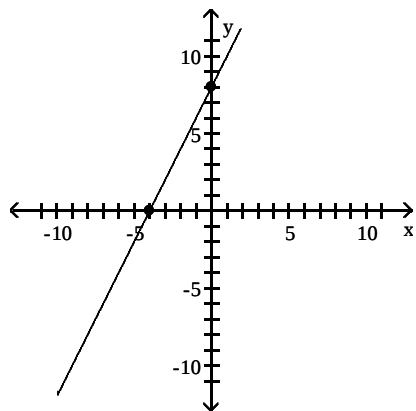
D)



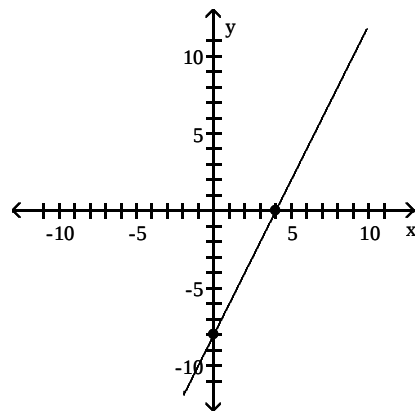
4) $y = 2x + 8$



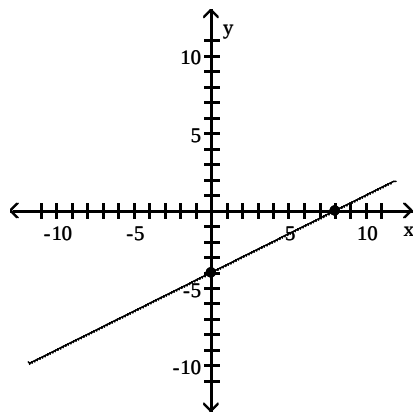
A)



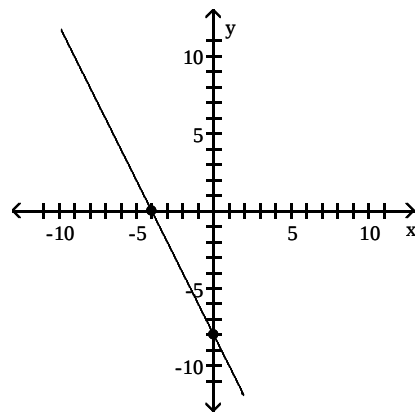
B)



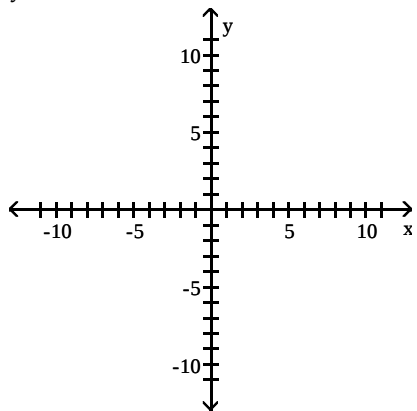
C)



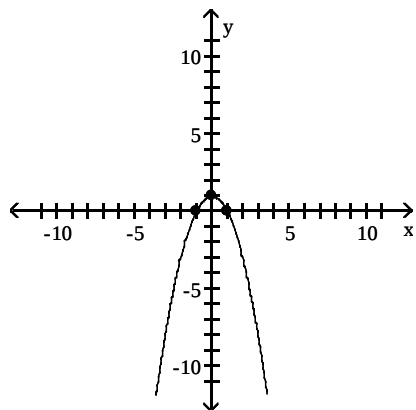
D)



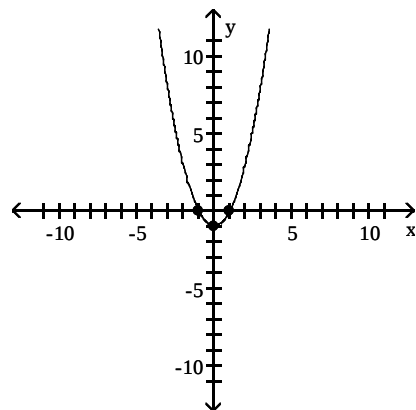
5) $y = -x^2 + 1$



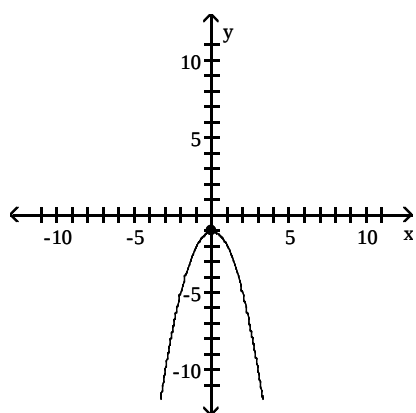
A)



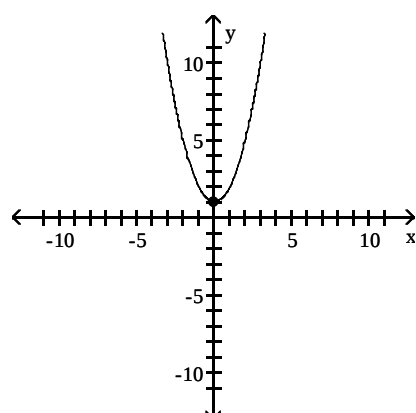
B)



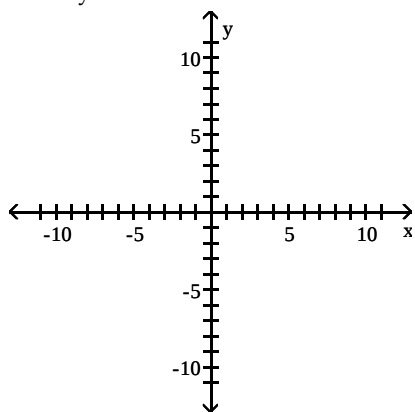
C)



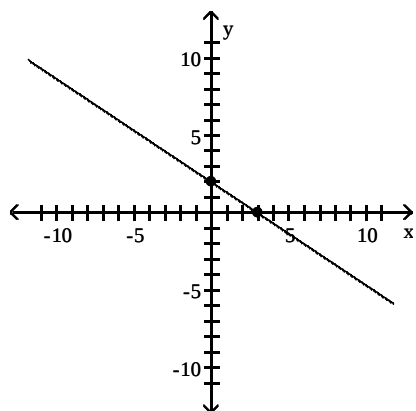
D)



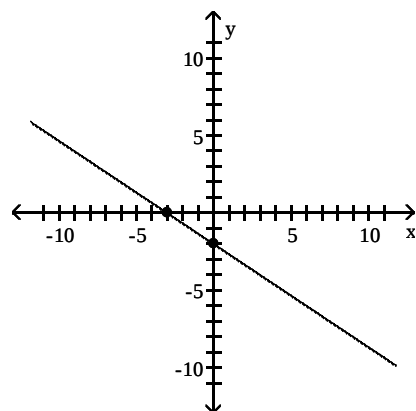
6) $2x + 3y = 6$



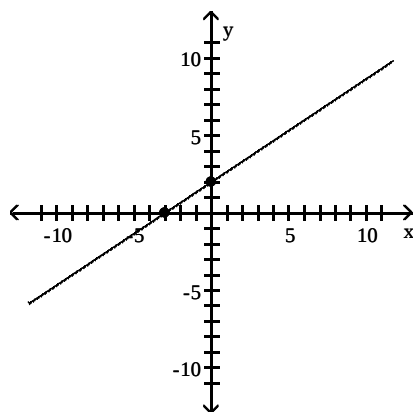
A)



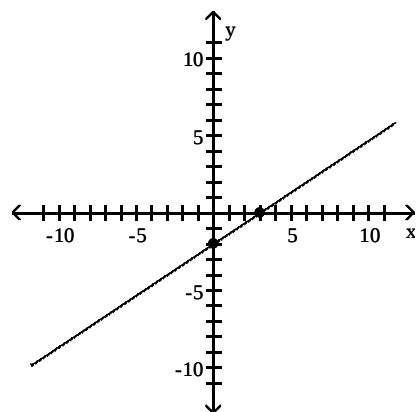
B)



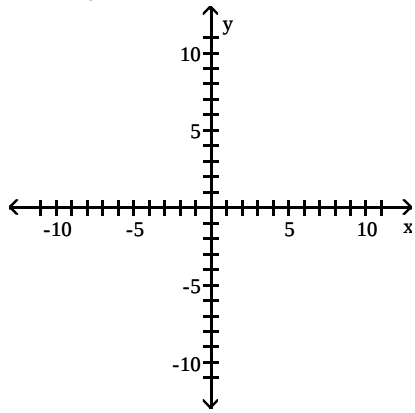
C)



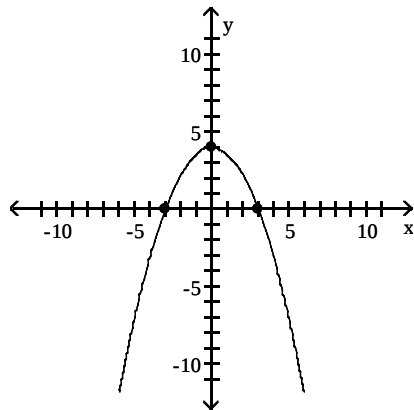
D)



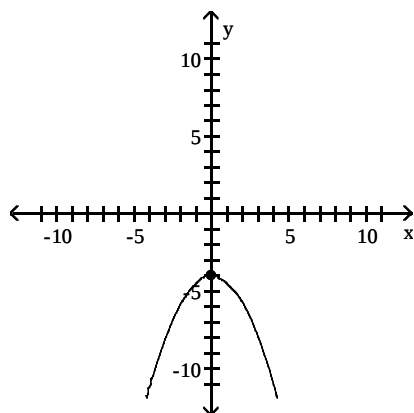
7) $4x^2 + 9y = 36$



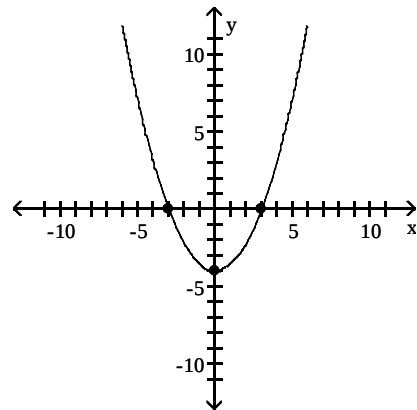
A)



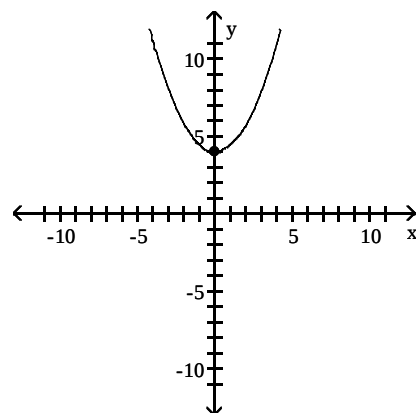
C)



B)



D)



Solve the problem.

8) If $(a, 3)$ is a point on the graph of $y = 2x - 5$, what is a ?

A) 4

B) 1

C) -1

D) -4

9) If $(3, b)$ is a point on the graph of $3x - 2y = 17$, what is b ?

A) -4

B) 4

C) $\frac{23}{3}$

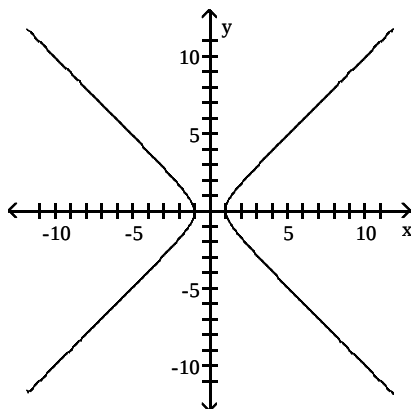
D) $\frac{11}{3}$

2 Find Intercepts from a Graph

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

List the intercepts of the graph.

10)



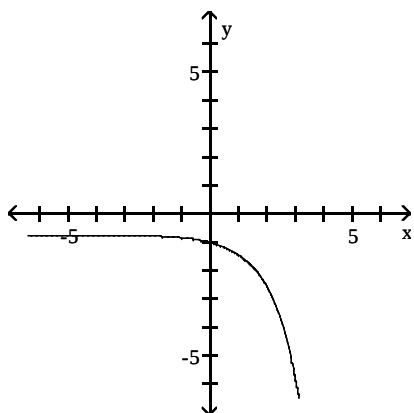
A) $(-1, 0), (1, 0)$

B) $(0, -1), (1, 0)$

C) $(0, -1), (0, 1)$

D) $(-1, 0), (0, 1)$

11)



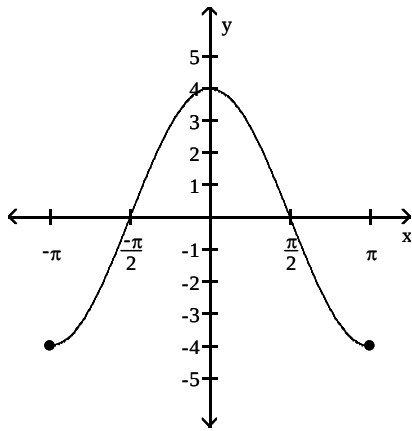
A) $(0, -1)$

B) $(0, 0)$

C) $(-1, -1)$

D) $(-1, 0)$

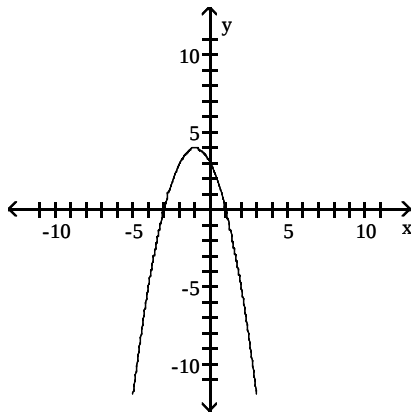
12)



A) $\left(-\frac{\pi}{2}, 0\right), (0, 4), \left(\frac{\pi}{2}, 0\right)$
 C) $\left(0, -\frac{\pi}{2}\right), (4, 0), \left(0, \frac{\pi}{2}\right)$

B) $\left(-\frac{\pi}{2}, 0\right), (4, 0), \left(\frac{\pi}{2}, 0\right)$
 D) $\left(0, -\frac{\pi}{2}\right), (0, 4), \left(0, \frac{\pi}{2}\right)$

13)



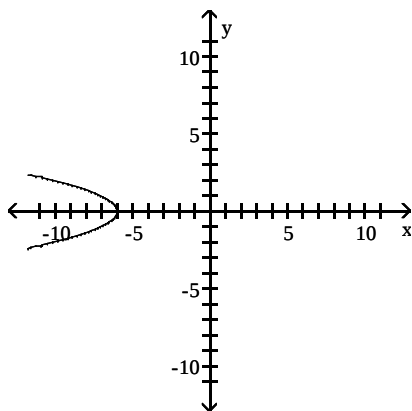
A) $(-3, 0), (0, 3), (1, 0)$

B) $(-3, 0), (0, 3), (0, 1)$

C) $(0, -3), (3, 0), (0, 1)$

D) $(0, -3), (0, 3), (1, 0)$

14)



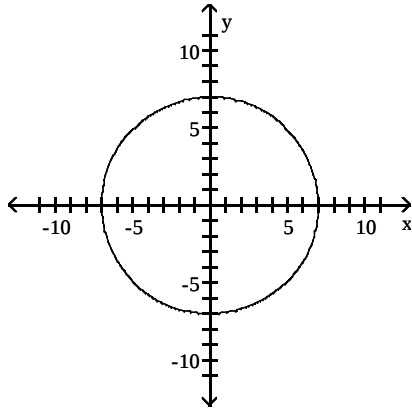
A) $(-6, 0)$

B) $(0, -6)$

C) $(6, 0)$

D) $(0, 6)$

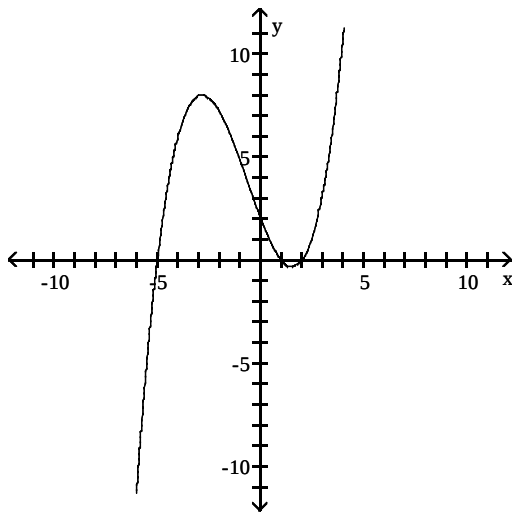
15)



- A) $(-7, 0), (0, -7), (0, 7), (7, 0)$
 C) $(-7, 0), (0, -7), (0, 0), (0, 7), (7, 0)$

- B) $(-7, 0), (0, 7)$
 D) $(0, 7), (7, 0)$

16)



- A) $(2, 0), (1, 0), (-5, 0), (0, 2)$
 C) $(-2, 0), (1, 0), (5, 0), (0, 2)$

- B) $(2, 0), (0, 2), (0, 1), (0, -5)$
 D) $(2, 0), (0, -2), (0, 1), (0, 5)$

3 Find Intercepts from an Equation

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

List the intercepts for the graph of the equation.

17) $y = x + 5$

- A) $(-5, 0), (0, 5)$ B) $(5, 0), (0, -5)$ C) $(-5, 0), (0, -5)$ D) $(5, 0), (0, 5)$

18) $y = -4x$

- A) $(0, 0)$ B) $(0, -4)$ C) $(-4, 0)$ D) $(-4, -4)$

19) $y^2 = x + 49$

- A) $(0, -7), (-49, 0), (0, 7)$ B) $(-7, 0), (0, -49), (7, 0)$
 C) $(0, -7), (49, 0), (0, 7)$ D) $(7, 0), (0, 49), (0, -49)$

20) $y = \sqrt[9]{x}$

- A) $(0, 0)$ B) $(1, 0)$ C) $(0, 1)$ D) $(1, 1)$

21) $x^2 + y - 49 = 0$

A) $(-7, 0), (0, 49), (7, 0)$

C) $(0, -7), (49, 0), (0, 7)$

B) $(-7, 0), (0, -49), (7, 0)$

D) $(7, 0), (0, 49), (0, -49)$

22) $9x^2 + 16y^2 = 144$

A) $(-4, 0), (0, -3), (0, 3), (4, 0)$

C) $(-16, 0), (0, -9), (0, 9), (16, 0)$

B) $(-3, 0), (-4, 0), (4, 0), (3, 0)$

D) $(-9, 0), (-16, 0), (16, 0), (9, 0)$

23) $16x^2 + y^2 = 16$

A) $(-1, 0), (0, -4), (0, 4), (1, 0)$

C) $(-4, 0), (0, -1), (0, 1), (4, 0)$

B) $(-1, 0), (0, -16), (0, 16), (1, 0)$

D) $(-16, 0), (0, -1), (0, 1), (16, 0)$

24) $y = x^3 - 125$

A) $(0, -125), (5, 0)$

B) $(-125, 0), (0, 5)$

C) $(0, -5), (0, 5)$

D) $(0, -5), (-5, 0)$

25) $y = x^4 - 16$

A) $(0, -16), (-2, 0), (2, 0)$

C) $(0, 16), (-2, 0), (2, 0)$

B) $(0, -16)$

D) $(0, 16)$

26) $y = x^2 + 14x + 48$

A) $(-6, 0), (-8, 0), (0, 48)$

C) $(0, -6), (0, -8), (48, 0)$

B) $(6, 0), (8, 0), (0, 48)$

D) $(0, 6), (0, 8), (48, 0)$

27) $y = x^2 + 1$

A) $(0, 1)$

B) $(0, 1), (-1, 0), (1, 0)$

C) $(1, 0), (0, -1), (0, 1)$

D) $(1, 0)$

28) $y = \frac{4x}{x^2 + 16}$

A) $(0, 0)$

C) $(-16, 0), (0, 0), (16, 0)$

B) $(-4, 0), (0, 0), (4, 0)$

D) $(0, -4), (0, 0), (0, 4)$

29) $y = \frac{x^2 - 64}{8x^4}$

A) $(-8, 0), (8, 0)$

C) $(-64, 0), (0, 0), (64, 0)$

B) $(0, 0)$

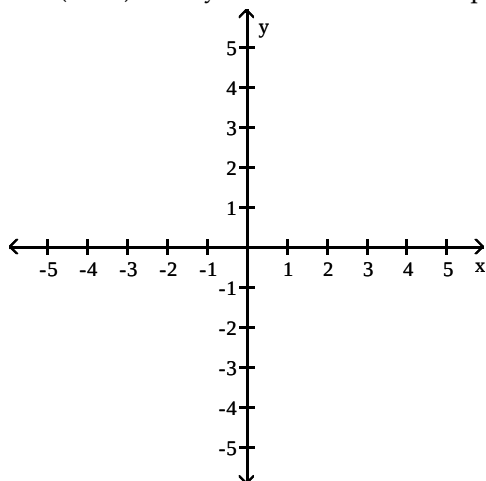
D) $(0, -8), (0, 8)$

4 Test an Equation for Symmetry

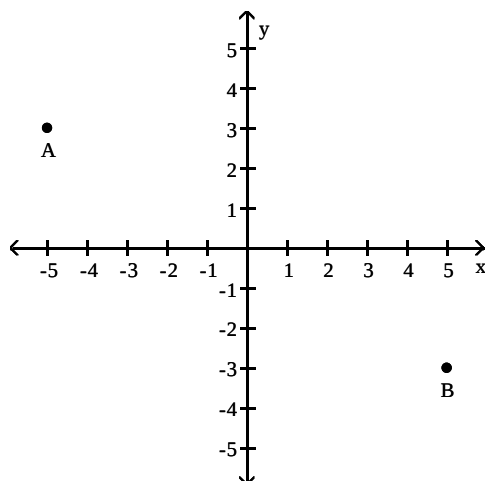
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Plot the point A. Plot the point B that has the given symmetry with point A.

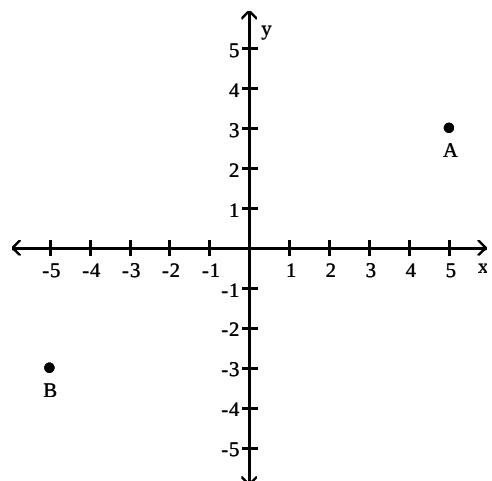
30) $A = (-5, 3)$; B is symmetric to A with respect to the origin



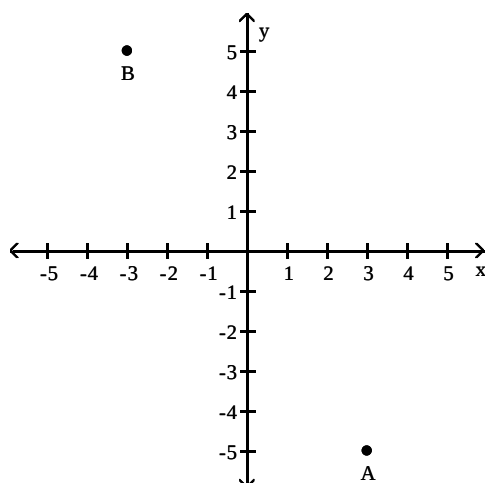
A)



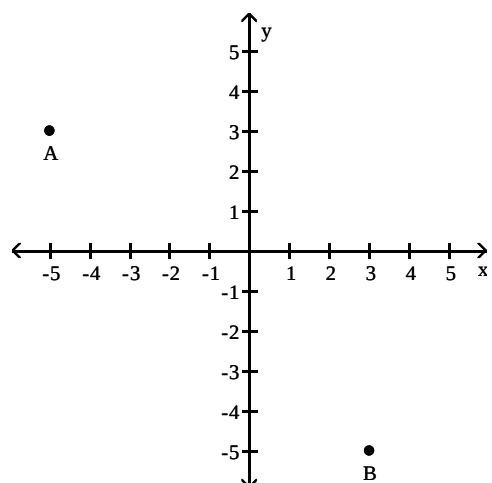
B)



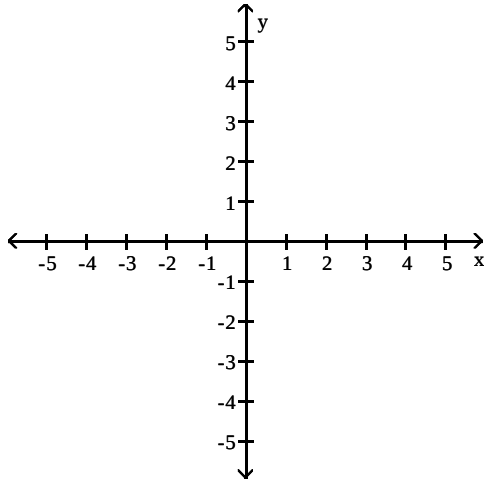
C)



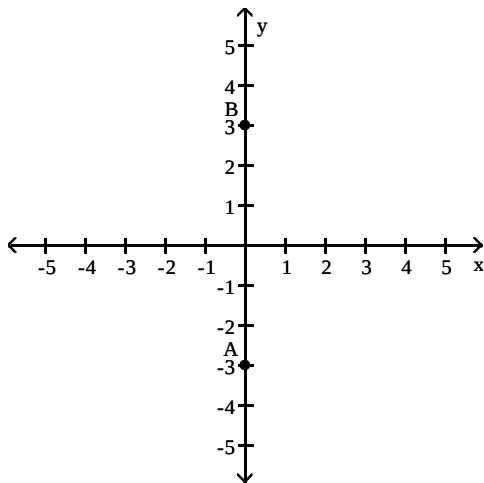
D)



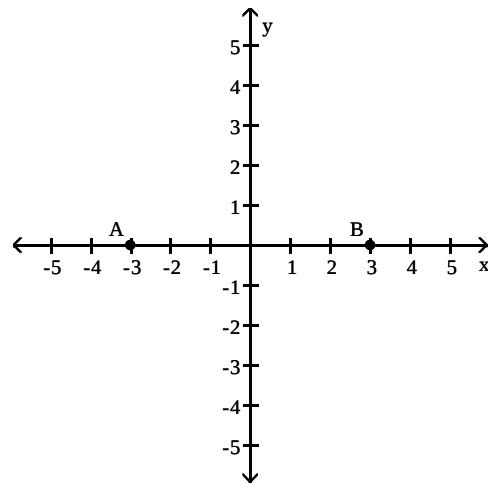
31) $A = (-0, -3)$; B is symmetric to A with respect to the origin



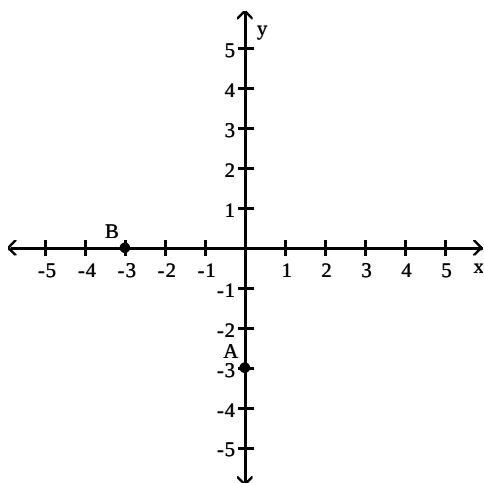
A)



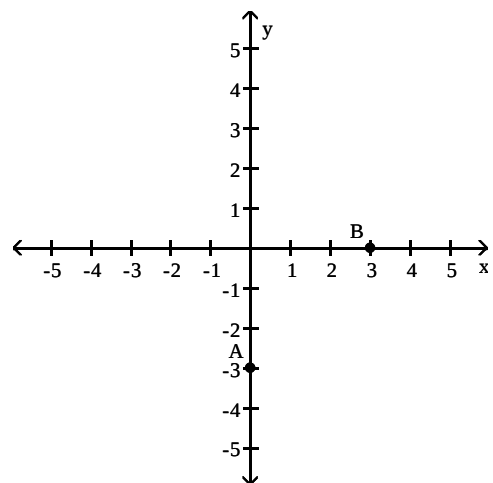
B)



C)

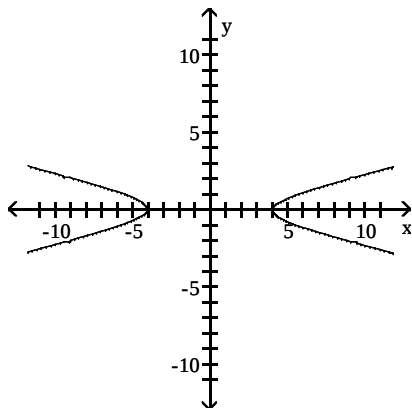


D)



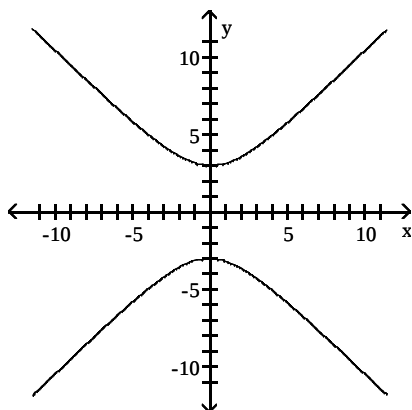
List the intercepts of the graph. Tell whether the graph is symmetric with respect to the x -axis, y -axis, origin, or none of these.

32)



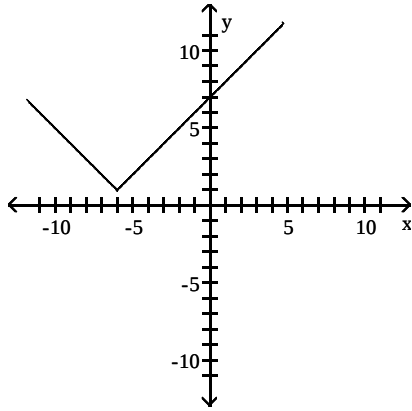
- A) intercepts: $(-4, 0)$ and $(4, 0)$
symmetric with respect to x -axis, y -axis, and origin
- B) intercepts: $(-4, 0)$ and $(4, 0)$
symmetric with respect to origin
- C) intercepts: $(0, -4)$ and $(0, 4)$
symmetric with respect to x -axis, y -axis, and origin
- D) intercepts: $(0, -4)$ and $(0, 4)$
symmetric with respect to y -axis

33)



- A) intercepts: $(0, 3)$ and $(0, -3)$
symmetric with respect to x -axis, y -axis, and origin
- B) intercepts: $(0, 3)$ and $(0, -3)$
symmetric with respect to origin
- C) intercepts: $(3, 0)$ and $(-3, 0)$
symmetric with respect to x -axis, y -axis, and origin
- D) intercepts: $(3, 0)$ and $(-3, 0)$
symmetric with respect to y -axis

34)



A) intercept: (0, 7)

no symmetry

C) intercept: (0, 7)

symmetric with respect to x-axis

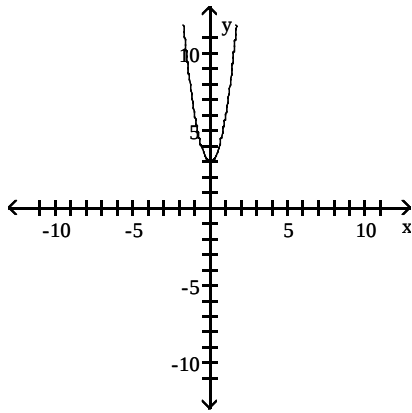
B) intercept: (7, 0)

no symmetry

D) intercept: (7, 0)

symmetric with respect to y-axis

35)



A) intercept: (0, 3)

symmetric with respect to y-axis

C) intercept: (3, 0)

symmetric with respect to y-axis

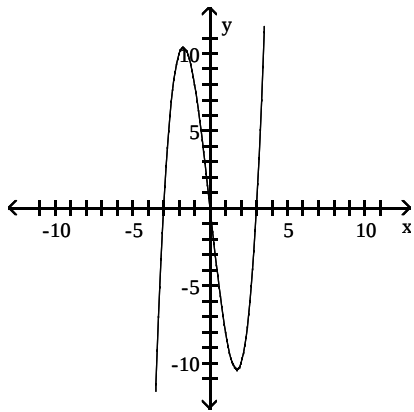
B) intercept: (0, 3)

symmetric with respect to origin

D) intercept: (3, 0)

symmetric with respect to x-axis

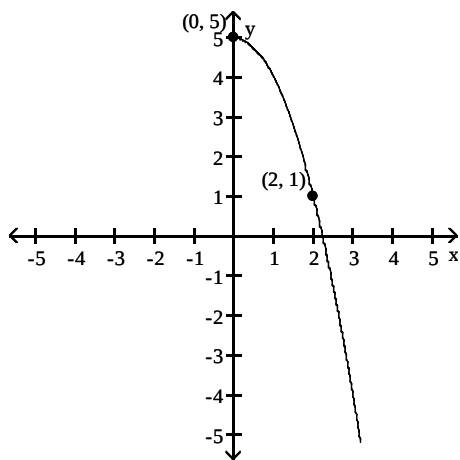
36)



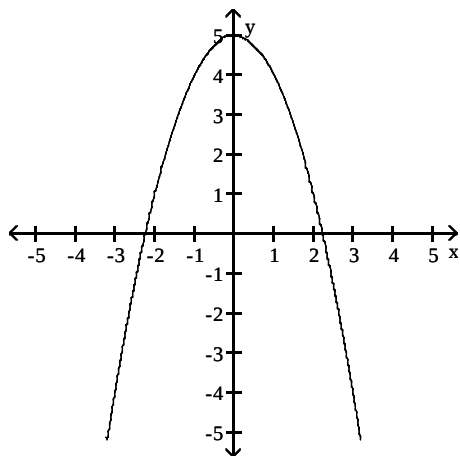
- A) intercepts: $(-3, 0)$, $(0, 0)$, $(3, 0)$
symmetric with respect to origin
- B) intercepts: $(-3, 0)$, $(0, 0)$, $(3, 0)$
symmetric with respect to x-axis
- C) intercepts: $(-3, 0)$, $(0, 0)$, $(3, 0)$
symmetric with respect to y-axis
- D) intercepts: $(-3, 0)$, $(0, 0)$, $(3, 0)$
symmetric with respect to x-axis, y-axis, and origin

Draw a complete graph so that it has the given type of symmetry.

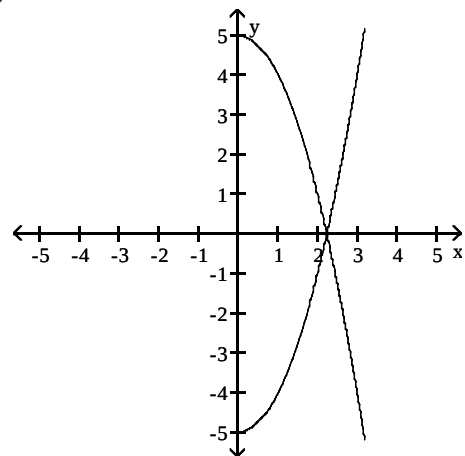
37) Symmetric with respect to the y-axis



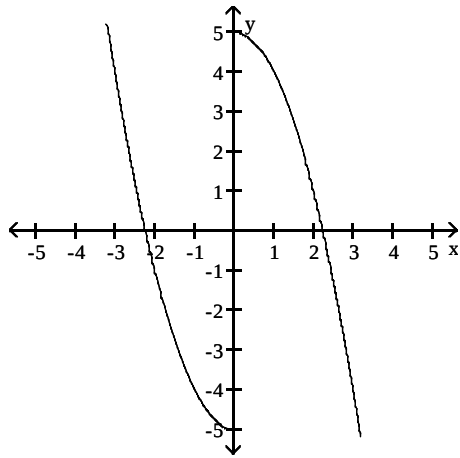
A)



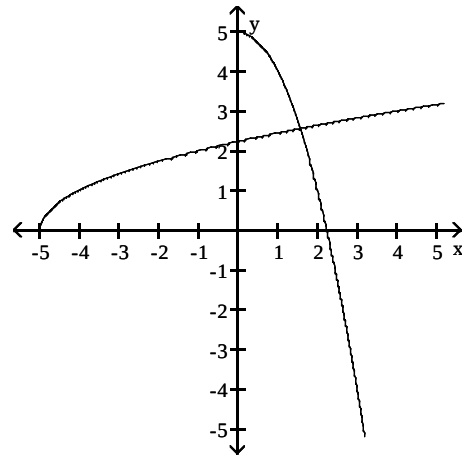
B)



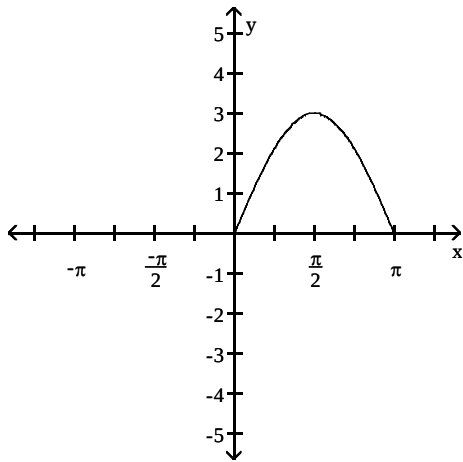
C)



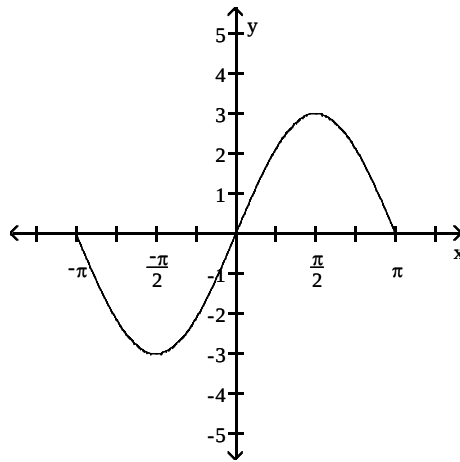
D)



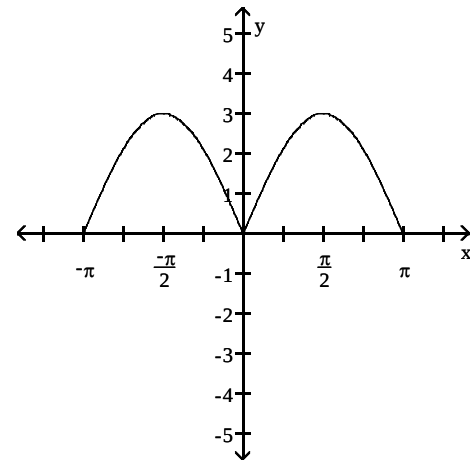
38) origin



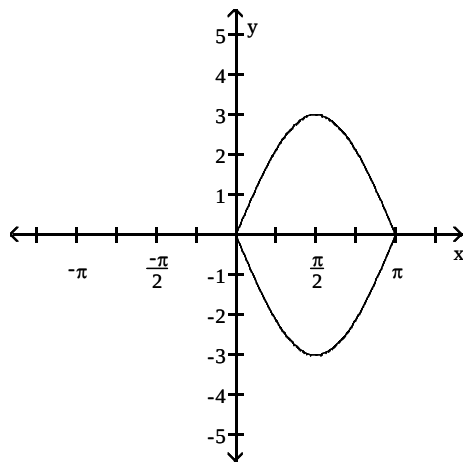
A)



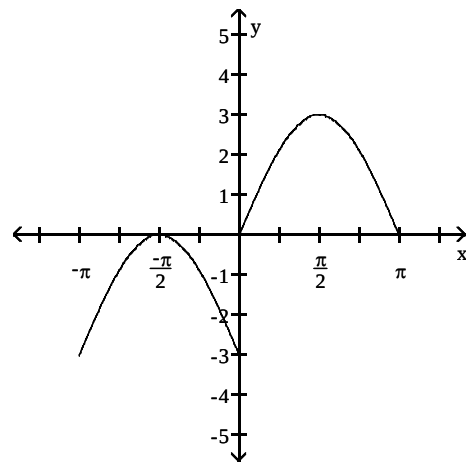
B)



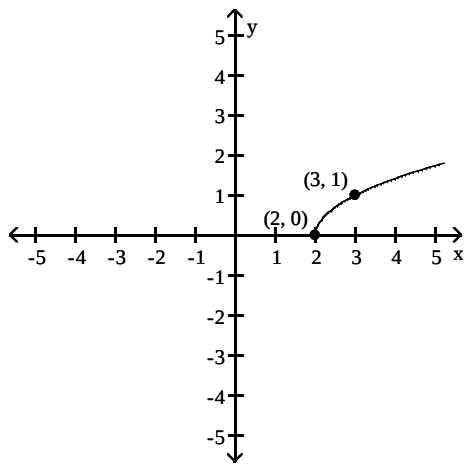
C)



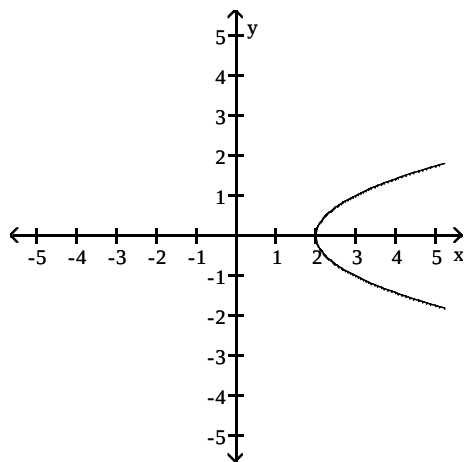
D)



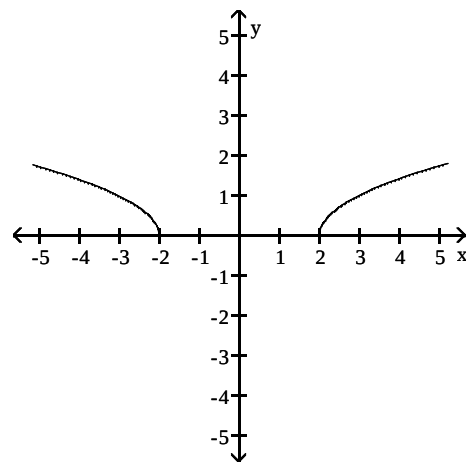
39) Symmetric with respect to the x-axis



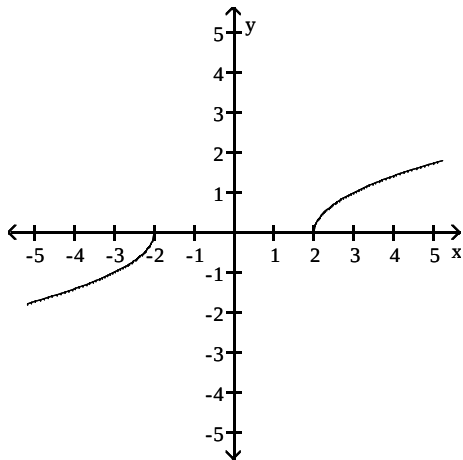
A)



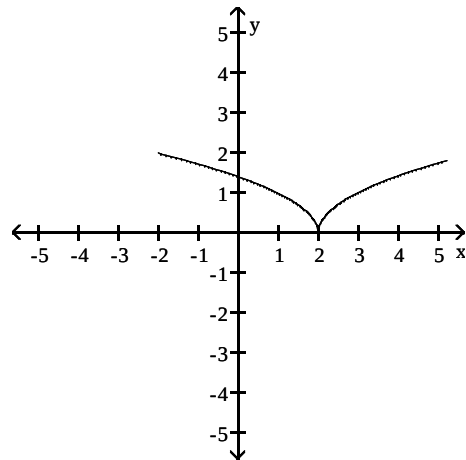
B)



C)



D)



List the intercepts and type(s) of symmetry, if any.

40) $y^2 = -x + 9$

- A) intercepts: (9, 0), (0, 3), (0, -3)
symmetric with respect to x-axis
C) intercepts: (0, 9), (3, 0), (-3, 0)
symmetric with respect to y-axis

- B) intercepts: (-9, 0), (0, 3), (0, -3)
symmetric with respect to x-axis
D) intercepts: (0, -9), (3, 0), (-3, 0)
symmetric with respect to y-axis

41) $16x^2 + 4y^2 = 64$

- A) intercepts: (2, 0), (-2, 0), (0, 4), (0, -4)
symmetric with respect to x-axis, y-axis, and origin
B) intercepts: (4, 0), (-4, 0), (0, 2), (0, -2)
symmetric with respect to x-axis and y-axis
C) intercepts: (2, 0), (-2, 0), (0, 4), (0, -4)
symmetric with respect to x-axis and y-axis
D) intercepts: (4, 0), (-4, 0), (0, 2), (0, -2)
symmetric with respect to the origin

42) $y = \frac{-x^3}{x^2 - 9}$

- A) intercept: (0, 0)
symmetric with respect to origin
C) intercept: (0, 0)
symmetric with respect to x-axis

- B) intercepts: (3, 0), (-3, 0), (0, 0)
symmetric with respect to origin
D) intercept: (0, 0)
symmetric with respect to y-axis

Determine whether the graph of the equation is symmetric with respect to the x-axis, the y-axis, and/or the origin.

43) $y = x + 2$

- A) x-axis
B) y-axis
C) origin
D) x-axis, y-axis, origin
E) none

- 44) $y = -4x$
A) origin
B) x-axis
C) y-axis
D) x-axis, y-axis, origin
E) none

- 45) $x^2 + y - 81 = 0$
A) y-axis
B) x-axis
C) origin
D) x-axis, y-axis, origin
E) none

- 46) $y^2 - x - 81 = 0$
A) x-axis
B) y-axis
C) origin
D) x-axis, y-axis, origin
E) none

- 47) $4x^2 + 16y^2 = 64$
A) origin
B) x-axis
C) y-axis
D) x-axis, y-axis, origin
E) none

- 48) $9x^2 + y^2 = 9$
A) origin
B) x-axis
C) y-axis
D) x-axis, y-axis, origin
E) none

- 49) $y = x^2 + 11x + 24$
A) x-axis
B) y-axis
C) origin
D) x-axis, y-axis, origin
E) none

- 50) $y = \frac{7x}{x^2 + 49}$
A) origin
B) x-axis
C) y-axis
D) x-axis, y-axis, origin
E) none

$$51) y = \frac{x^2 - 81}{9x^4}$$

- A) y-axis
- B) x-axis
- C) origin
- D) x-axis, y-axis, origin
- E) none

$$52) y = 5x^2 - 4$$

- A) y-axis
- B) x-axis
- C) origin
- D) x-axis, y-axis, origin
- E) none

$$53) y = (x - 4)(x + 3)$$

- A) x-axis
- B) y-axis
- C) origin
- D) x-axis, y-axis, origin
- E) none

$$54) y = -5x^3 + 9x$$

- A) origin
- B) x-axis
- C) y-axis
- D) x-axis, y-axis, origin
- E) none

$$55) y = 2x^4 + 6x + 9$$

- A) origin
- B) x-axis
- C) y-axis
- D) x-axis, y-axis, origin
- E) none

Solve the problem.

56) If a graph is symmetric with respect to the y-axis and it contains the point (5, -6), which of the following points is also on the graph?

- A) (-5, -6)
- B) (-5, 6)
- C) (5, -6)
- D) (-6, 5)

57) If a graph is symmetric with respect to the origin and it contains the point (-4, 7), which of the following points is also on the graph?

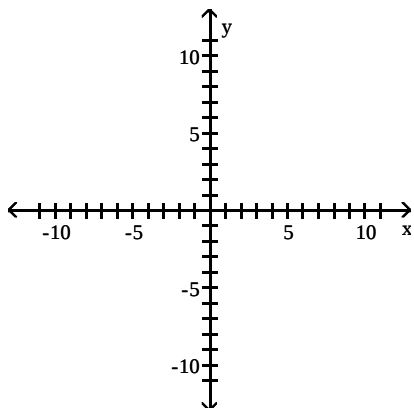
- A) (4, -7)
- B) (-4, -7)
- C) (4, 7)
- D) (7, -4)

5 Know How to Graph Key Equations

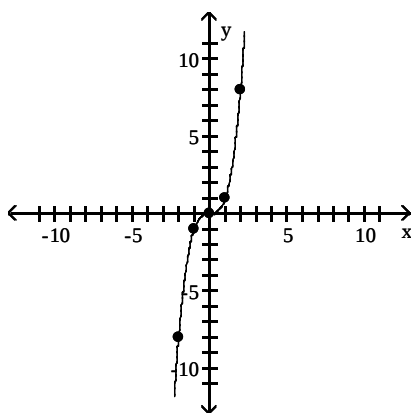
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the equation by plotting points.

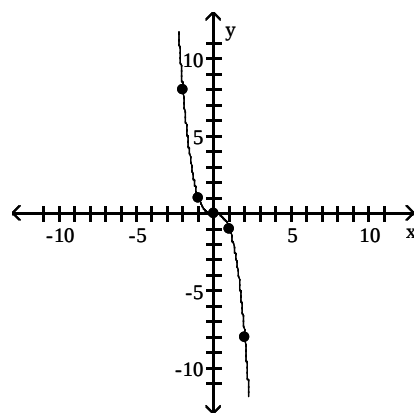
58) $y = x^3$



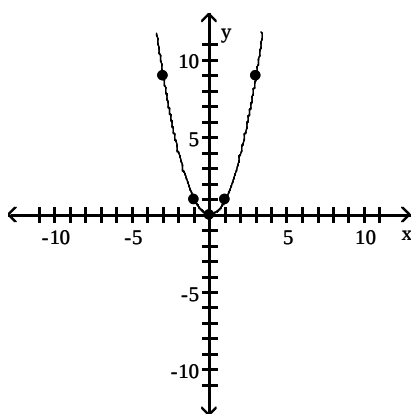
A)



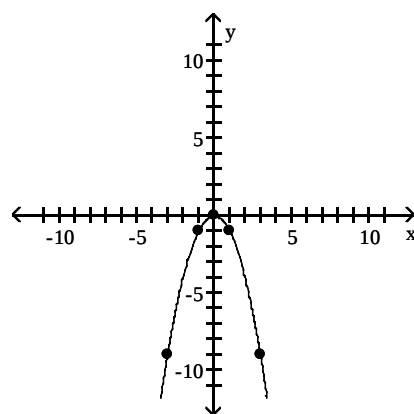
B)



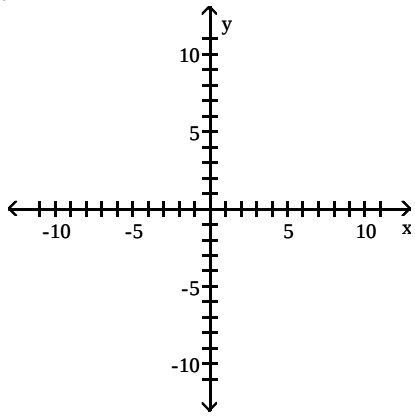
C)



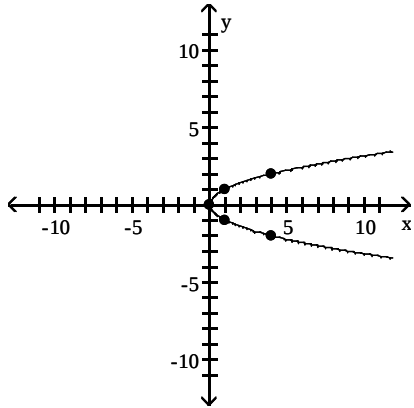
D)



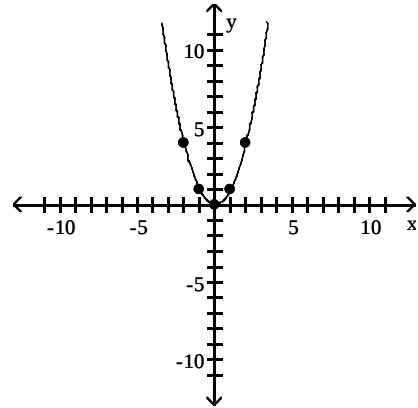
59) $x = y^2$



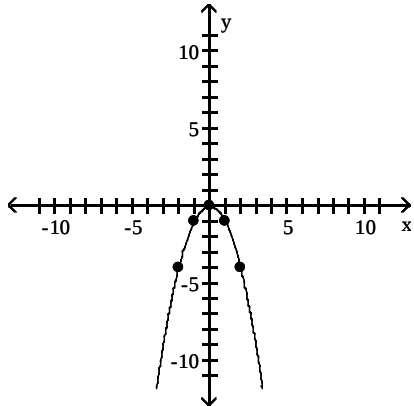
A)



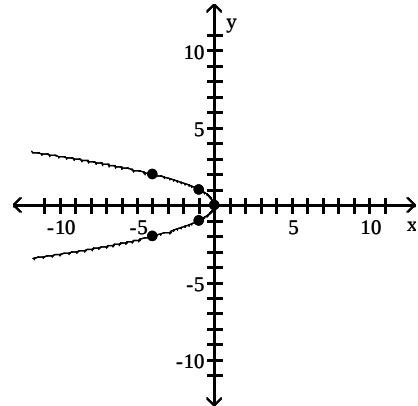
B)



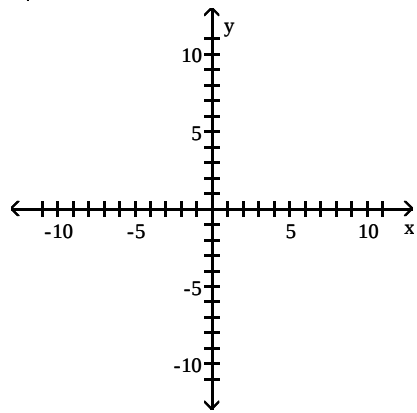
C)



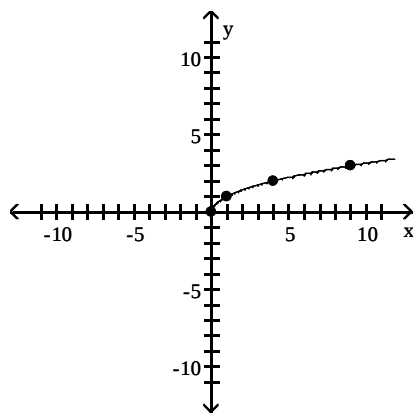
D)



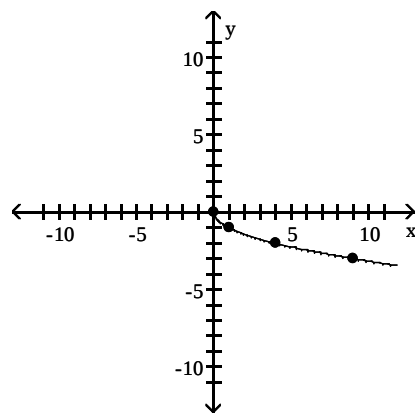
60) $y = \sqrt{x}$



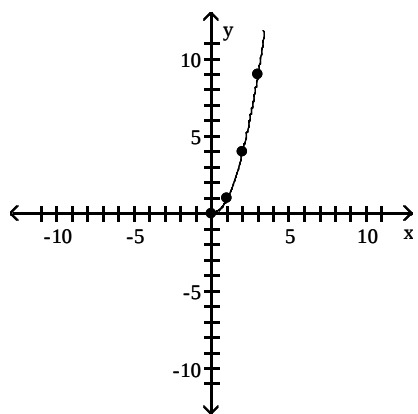
A)



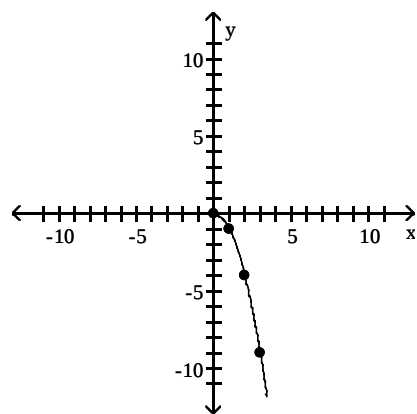
B)



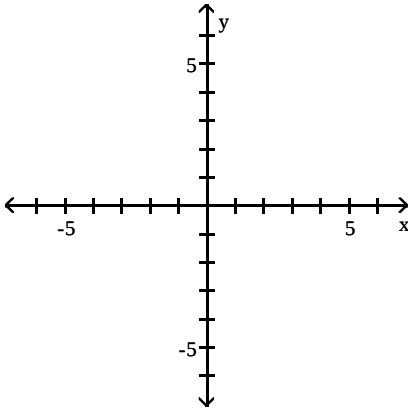
C)



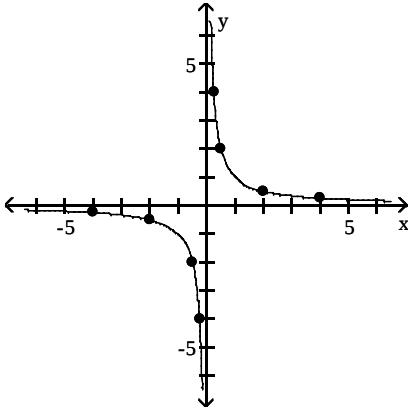
D)



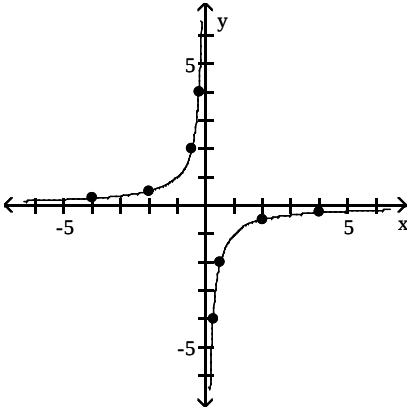
61) $y = \frac{1}{x}$



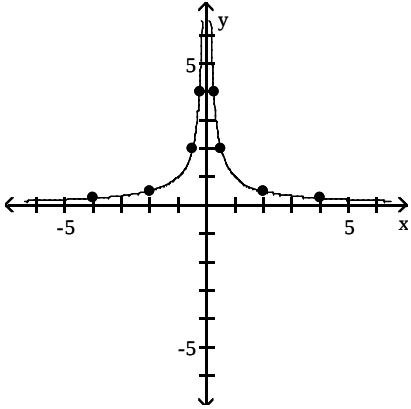
A)



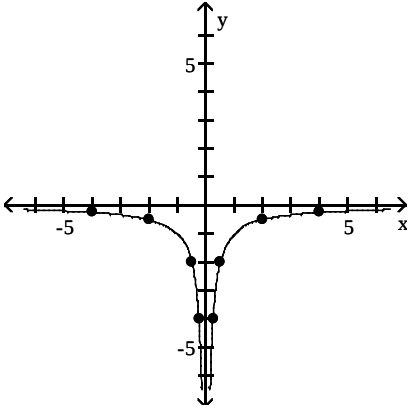
B)



C)



D)



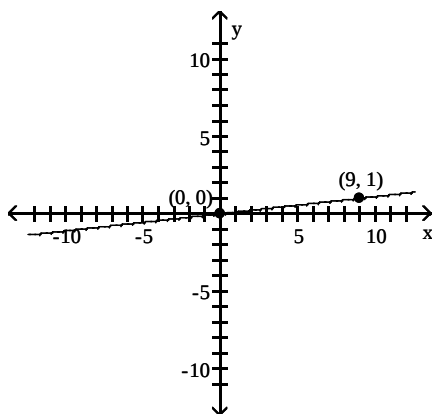
0.3 Lines

1 Calculate and Interpret the Slope of a Line

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the slope of the line through the points and interpret the slope.

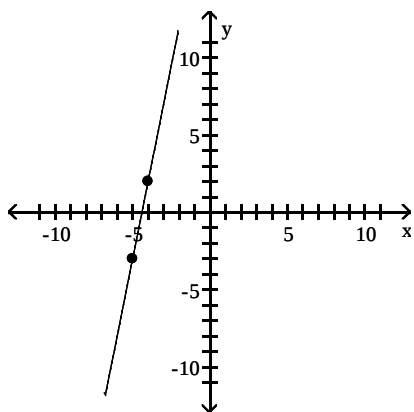
1)



- A) $\frac{1}{9}$; for every 9-unit increase in x , y will increase by 1 unit
- B) 9; for every 1-unit increase in x , y will increase by 9 units
- C) $-\frac{1}{9}$; for every 9-unit increase in x , y will decrease by 1 unit
- D) -9; for every 1-unit increase in x , y will decrease by 9 units

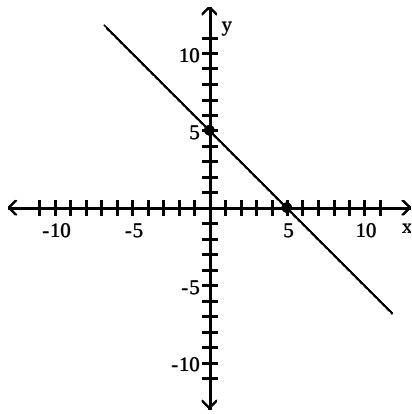
Find the slope of the line.

2)



- A) 5
- B) $\frac{1}{5}$
- C) -5
- D) $-\frac{1}{5}$

3)



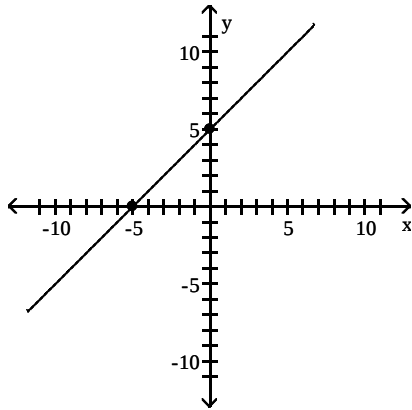
A) -1

B) 1

C) 5

D) -5

4)



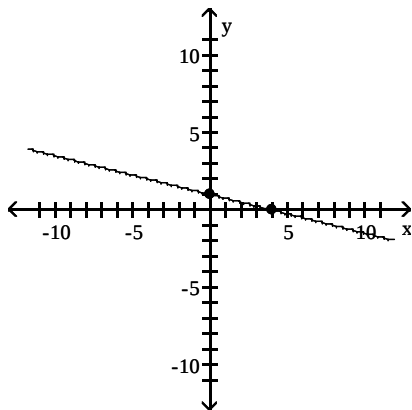
A) 1

B) -1

C) -5

D) 5

5)



A) $-\frac{1}{4}$

B) $\frac{1}{4}$

C) -4

D) 4

Find the slope of the line containing the two points.

6) $(5, 0); (-8, 4)$

A) $-\frac{4}{13}$

B) $\frac{4}{13}$

C) $\frac{13}{4}$

D) $-\frac{13}{4}$

7) $(3, 0); (0, 2)$

A) $-\frac{2}{3}$

B) $\frac{2}{3}$

C) $\frac{3}{2}$

D) $-\frac{3}{2}$

8) $(3, -2); (8, 6)$

A) $\frac{8}{5}$

B) $-\frac{8}{5}$

C) $\frac{5}{8}$

D) $-\frac{5}{8}$

9) $(-2, -5); (-2, -3)$

A) 2

B) $-\frac{1}{2}$

C) 0

D) undefined

10) $(4, 8); (-9, 8)$

A) 0

B) $\frac{1}{13}$

C) -13

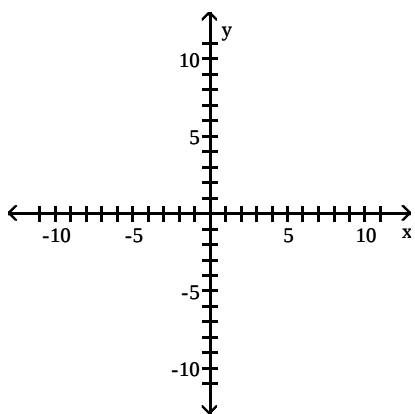
D) undefined

2 Graph Lines Given a Point and the Slope

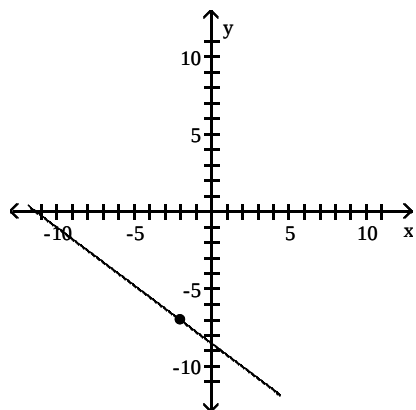
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the line containing the point P and having slope m.

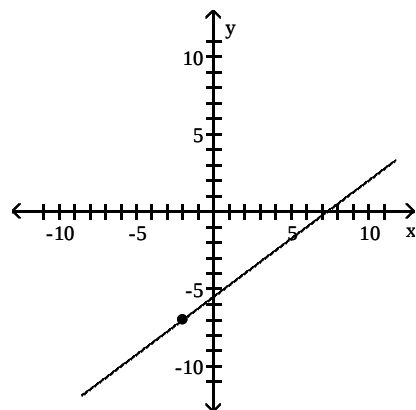
11) $P = (-2, -7)$; $m = -\frac{3}{4}$



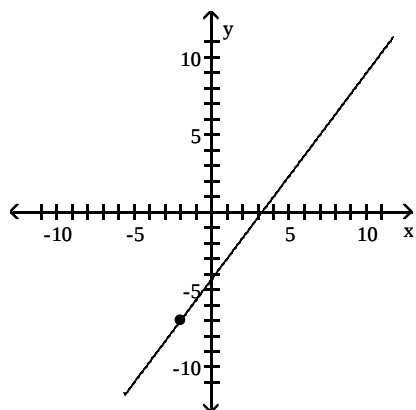
A)



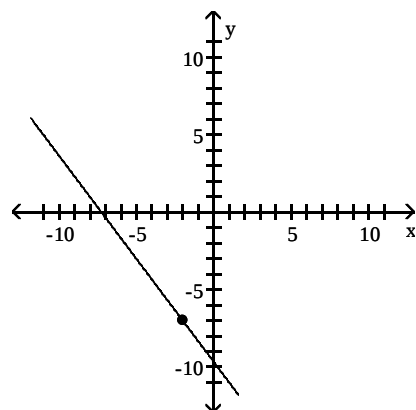
B)



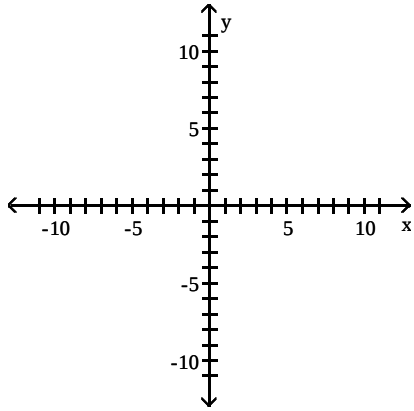
C)



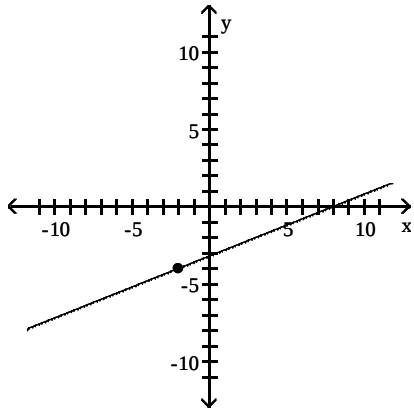
D)



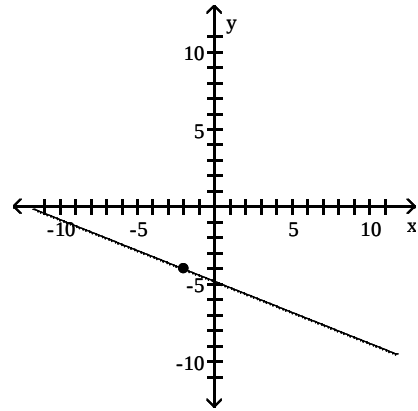
12) $P = (-2, -4)$; $m = \frac{2}{5}$



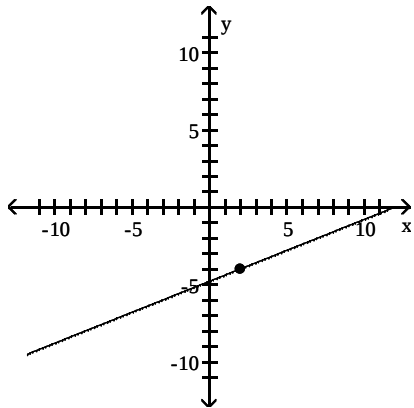
A)



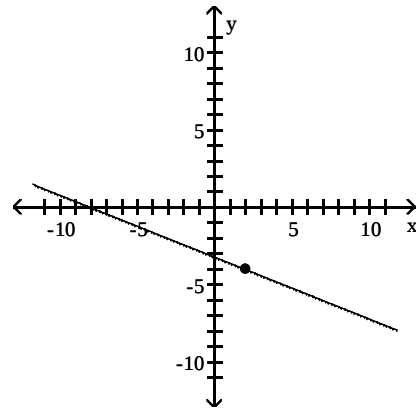
B)



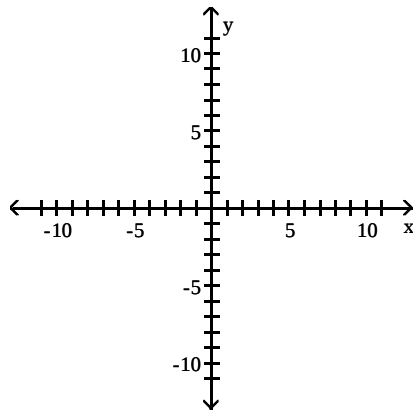
C)



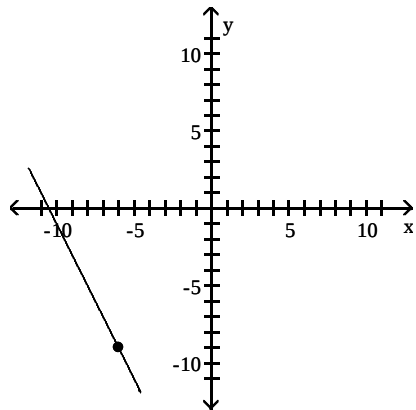
D)



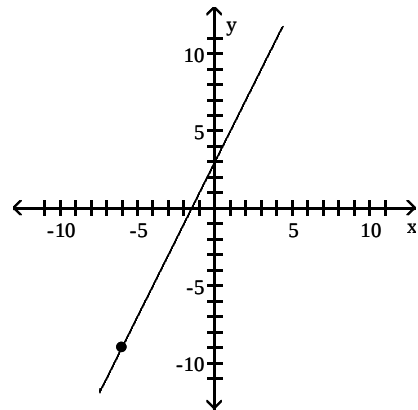
13) $P = (-6, -9)$; $m = -2$



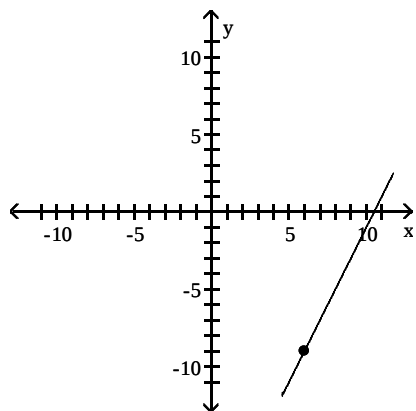
A)



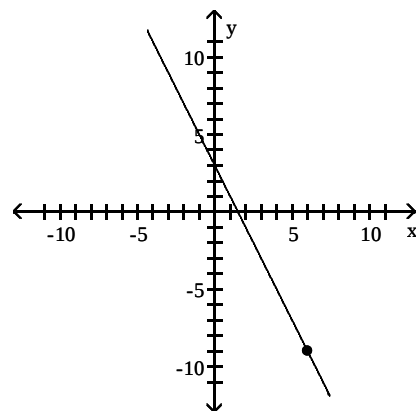
B)



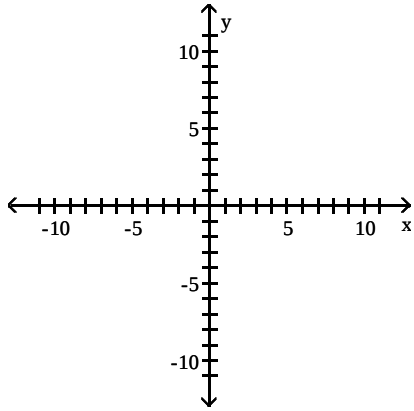
C)



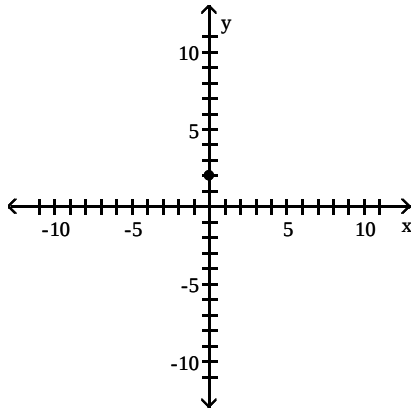
D)



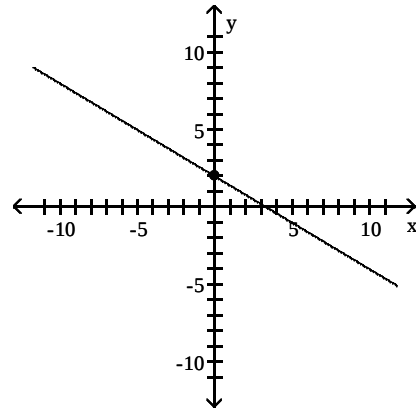
14) $P = (0, 2)$; $m = \frac{3}{5}$



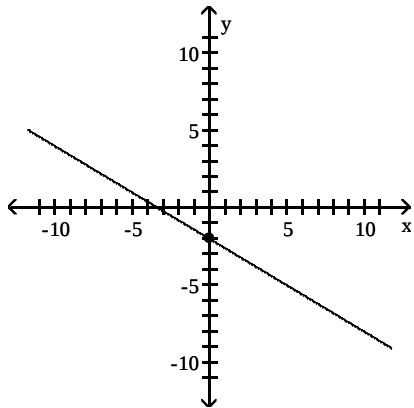
A)



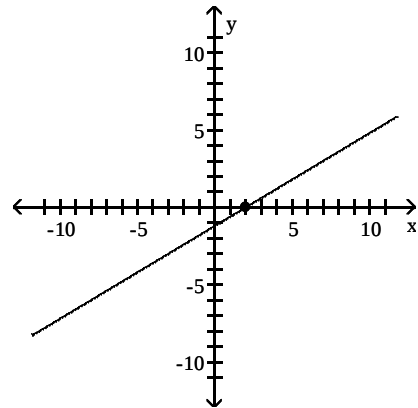
B)



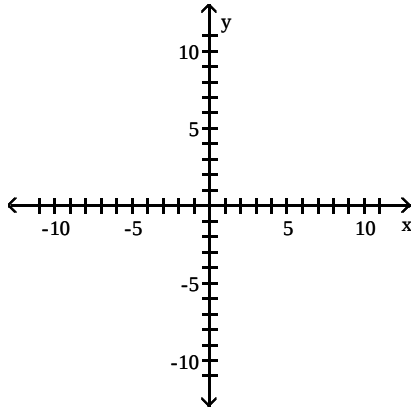
C)



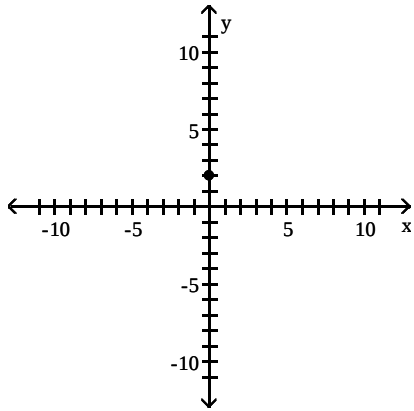
D)



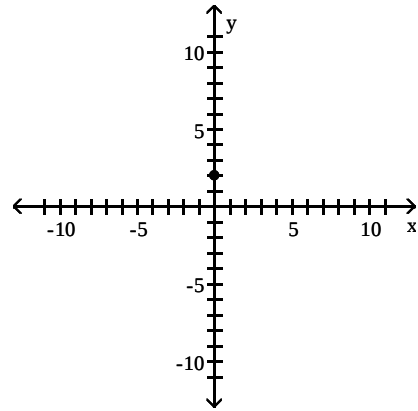
15) $P = (0, 2); m = -\frac{2}{3}$



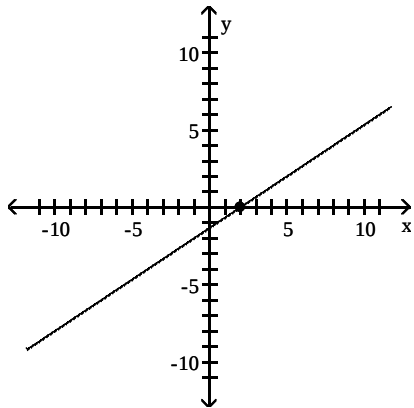
A)



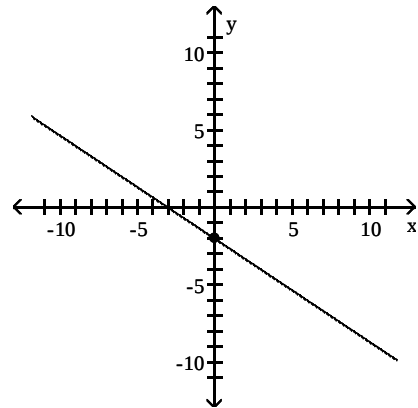
B)



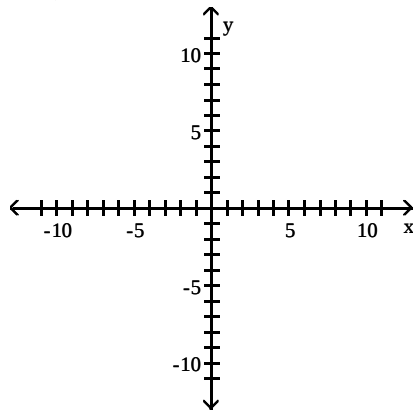
C)



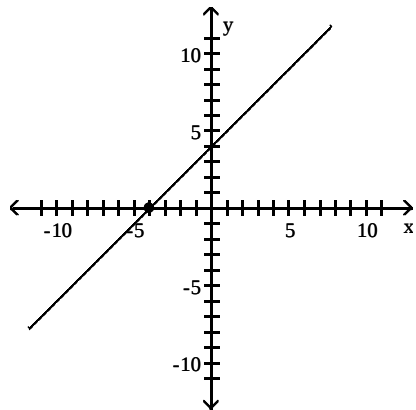
D)



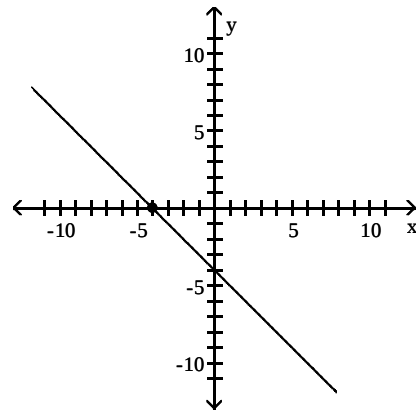
16) $P = (-4, 0)$; $m = 1$



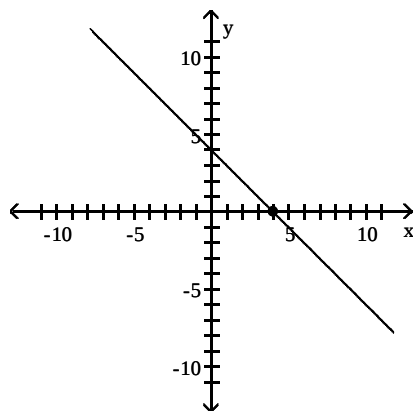
A)



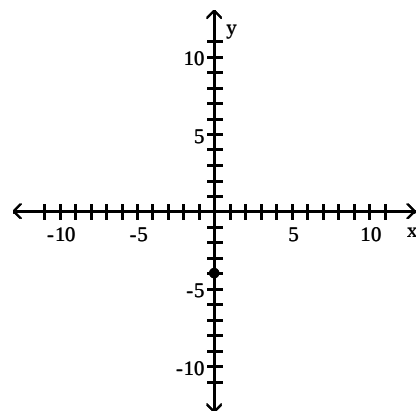
B)



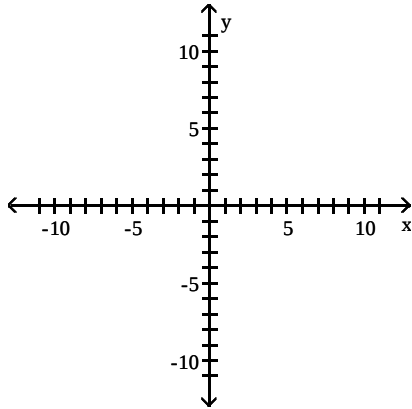
C)



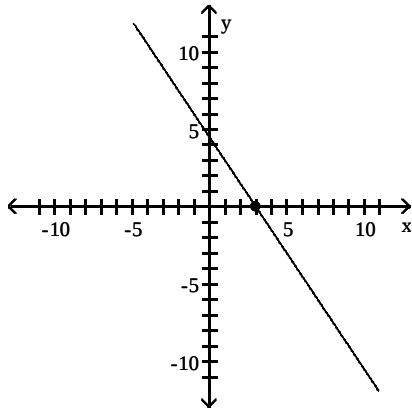
D)



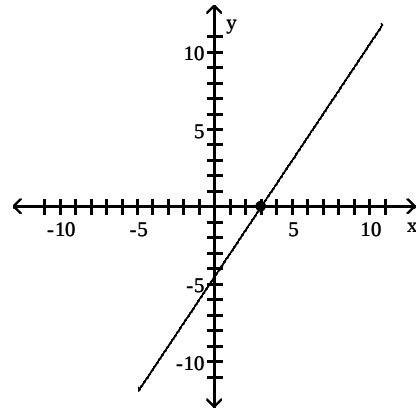
17) $P = (3, 0)$; $m = -\frac{3}{2}$



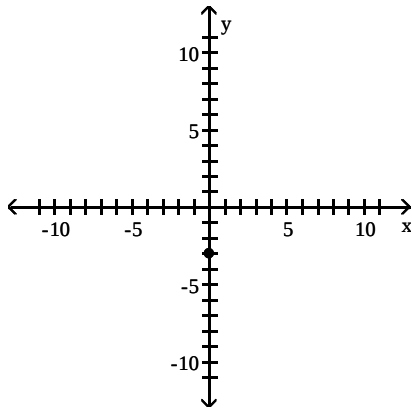
A)



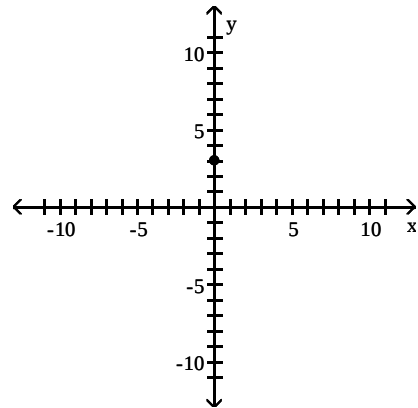
B)



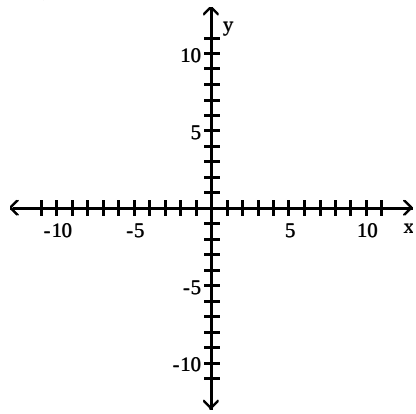
C)



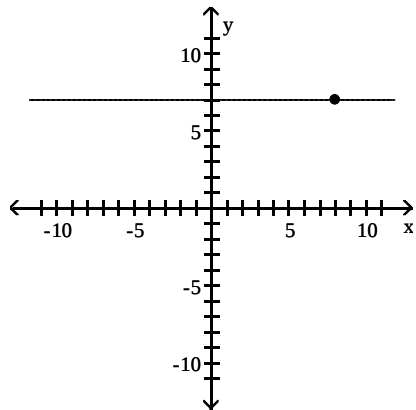
D)



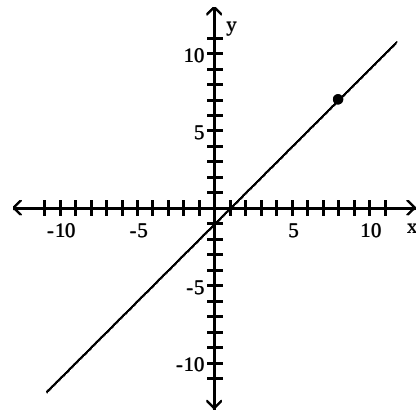
18) $P = (8, 7)$; $m = 0$



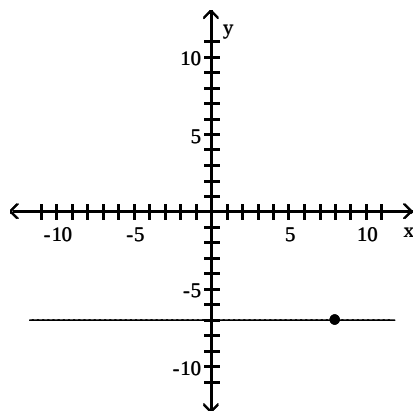
A)



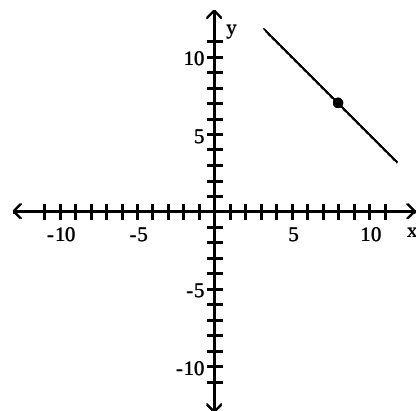
B)



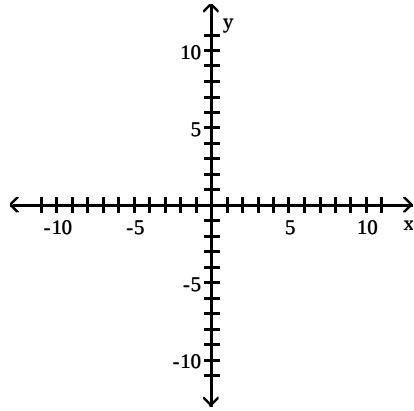
C)



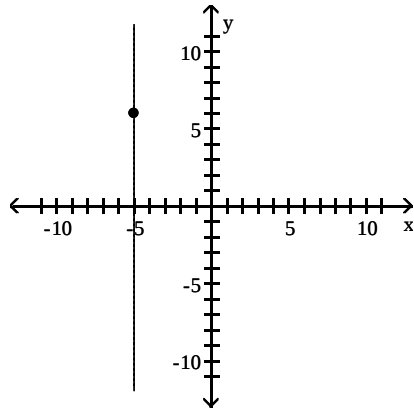
D)



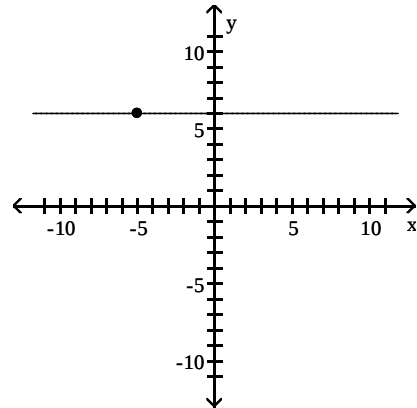
19) $P = (-5, 6)$; slope undefined



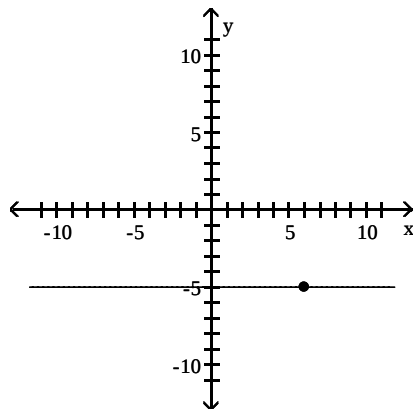
A)



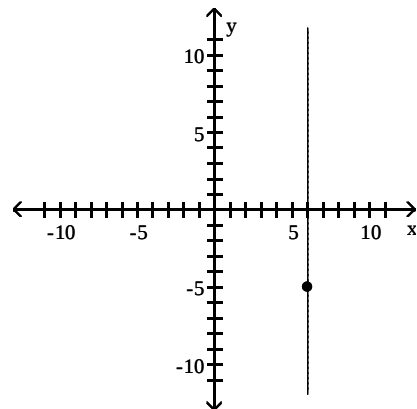
B)



C)



D)



3 Find the Equation of a Vertical Line

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find an equation for the line with the given properties.

20) Slope undefined; containing the point $(8, -3)$

A) $x = 8$

B) $y = 8$

C) $x = -3$

D) $y = -3$

21) Vertical line; containing the point $(5, -3)$

A) $x = 5$

B) $y = 5$

C) $x = -3$

D) $y = -3$

22) Slope undefined; containing the point $\left(-\frac{2}{3}, 3\right)$

A) $x = -\frac{2}{3}$

B) $y = 3$

C) $y = -\frac{2}{3}$

D) $x = 3$

23) Vertical line; containing the point $(-0.9, 5.4)$

A) $x = -0.9$

B) $x = 5.4$

C) $x = 0$

D) $x = 4.5$

4 Use the Point-Slope Form of a Line; Identify Horizontal Lines

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the slope-intercept form of the equation of the line with the given properties.

24) Horizontal; containing the point $(-1, 7)$

A) $y = 7$

B) $y = -1$

C) $x = 7$

D) $x = -1$

25) Slope = 0; containing the point $(7, 2)$

A) $y = 2$

B) $y = 7$

C) $x = 2$

D) $x = 7$

26) Horizontal; containing the point $\left(-\frac{3}{5}, 2\right)$

A) $y = 2$

B) $y = -\frac{3}{5}$

C) $y = 0$

D) $y = -2$

27) Horizontal; containing the point $(0.5, 0.2)$

A) $y = 0.2$

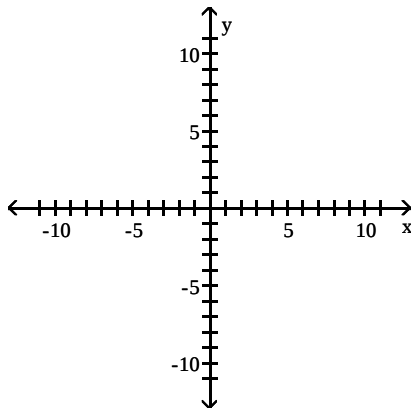
B) $y = 0.5$

C) $y = 0.7$

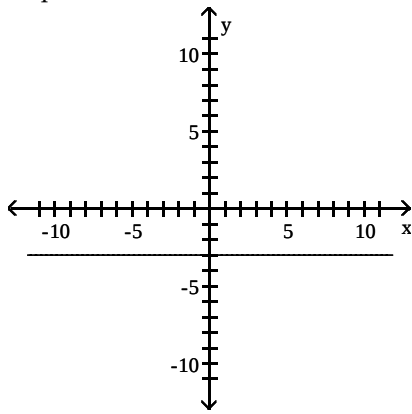
D) $y = 0$

Find the slope of the line and sketch its graph.

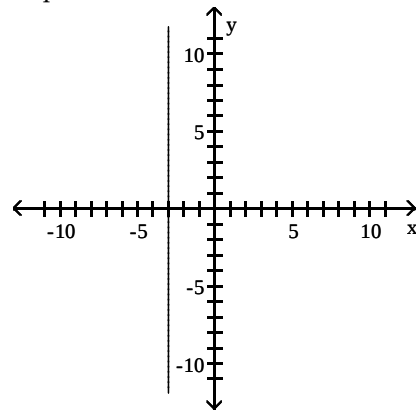
28) $y + 3 = 0$



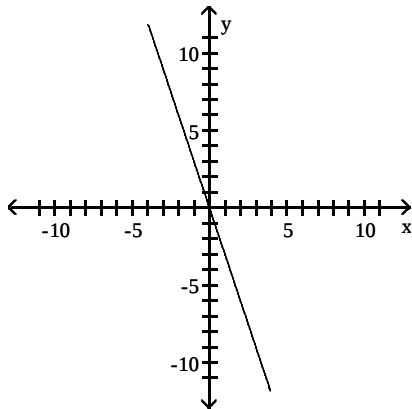
A) slope = 0



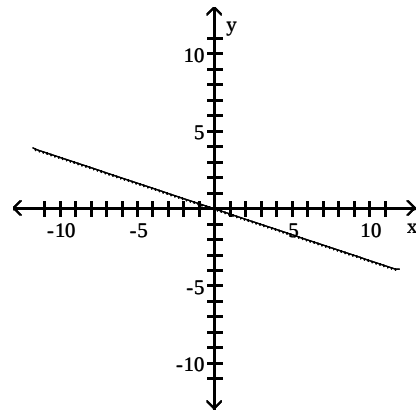
B) slope is undefined



C) slope = -3



D) slope = $-\frac{1}{3}$

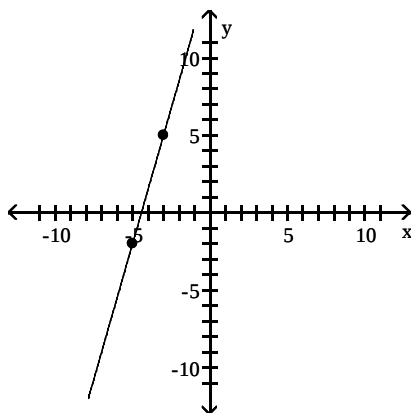


5 Find the Equation of a Line Given Two Points

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the equation of the line in slope-intercept form.

29)



A) $y = \frac{7}{2}x + \frac{31}{2}$

B) $y = \frac{2}{7}x + \frac{8}{31}$

C) $y = \frac{7}{2}x + \frac{9}{2}$

D) $y = \frac{7}{2}x - \frac{33}{2}$

Find an equation for the line, in the indicated form, with the given properties.

30) Containing the points $(-8, 1)$ and $(-4, 8)$; slope-intercept form

A) $y = \frac{7}{4}x + 15$

B) $y = mx + 15$

C) $y - 1 = \frac{7}{4}(x + 8)$

D) $y = -\frac{7}{4}x + 15$

31) Containing the points $(8, -2)$ and $(-6, 7)$; general form

A) $9x + 14y = 44$

B) $-9x + 14y = 44$

C) $-10x + 13y = -31$

D) $10x - 13y = -31$

32) Containing the points $(6, 0)$ and $(0, -2)$; general form

A) $2x - 6y = 12$

B) $2x + 6y = 12$

C) $y = -\frac{1}{3}x - 2$

D) $y = -\frac{1}{3}x + 6$

33) Containing the points $(6, -8)$ and $(0, 3)$; general form

A) $11x + 6y = 18$

B) $-11x + 6y = 18$

C) $-14x + 3y = -9$

D) $14x - 3y = -9$

34) Containing the points $(-3, 5)$ and $(0, -2)$; general form

A) $-7x - 3y = 6$

B) $7x - 3y = 6$

C) $8x - 2y = -4$

D) $-8x + 2y = -4$

35) Containing the points $(-3, 0)$ and $(0, -2)$; general form

A) $-2x - 3y = 6$

B) $2x - 3y = 6$

C) $3x - 2y = -4$

D) $-3x + 2y = -4$

36) Containing the points $(10, -8)$ and $(-9, 8)$; general form

A) $16x + 19y = 8$

B) $-16x + 19y = 8$

C) $-18x + 17y = 26$

D) $18x - 17y = 26$

Solve the problem.

37) The relationship between Celsius ($^{\circ}\text{C}$) and Fahrenheit ($^{\circ}\text{F}$) degrees of measuring temperature is linear. Find an equation relating $^{\circ}\text{C}$ and $^{\circ}\text{F}$ if 10°C corresponds to 50°F and 30°C corresponds to 86°F . Use the equation to find the Celsius measure of 25°F .

A) $C = \frac{5}{9}F - \frac{160}{9}$; $-\frac{35}{9}^{\circ}\text{C}$

B) $C = \frac{5}{9}F + \frac{160}{9}$; $\frac{95}{3}^{\circ}\text{C}$

C) $C = \frac{9}{5}F - 80$; -35°C

D) $C = \frac{5}{9}F - 10$; $\frac{35}{9}^{\circ}\text{C}$

6 Write the Equation of a Line in Slope-Intercept Form

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the slope-intercept form of the equation of the line with the given properties.

38) Slope = 2; containing the point $(-4, -3)$

A) $y = 2x + 5$

B) $y = 2x - 5$

C) $y = -2x - 5$

D) $y = -2x + 5$

39) Slope = 0; containing the point $(10, -1)$

A) $y = -1$

B) $y = 10$

C) $x = -1$

D) $x = 10$

40) Slope = 6; y-intercept = 9

A) $y = 6x + 9$

B) $y = 6x - 9$

C) $y = 9x - 6$

D) $y = 9x + 6$

41) x-intercept = 5; y-intercept = 7

A) $y = -\frac{7}{5}x + 7$

B) $y = -\frac{7}{5}x + 5$

C) $y = \frac{7}{5}x + 7$

D) $y = -\frac{5}{7}x + 5$

Write the equation in slope-intercept form.

42) $17x + 8y = 11$

A) $y = -\frac{17}{8}x + \frac{11}{8}$

B) $y = \frac{17}{8}x + \frac{11}{8}$

C) $y = 17x - 11$

D) $y = \frac{17}{8}x - \frac{11}{8}$

43) $6x + 7y = 1$

A) $y = \frac{6}{7}x + \frac{1}{7}$

B) $y = 6x + 10$

C) $y = \frac{10}{7}x + \frac{1}{7}$

D) $y = \frac{7}{6}x - \frac{1}{6}$

44) $5x - 6y = 7$

A) $y = \frac{5}{6}x - \frac{7}{6}$

B) $y = \frac{5}{6}x + \frac{7}{6}$

C) $y = \frac{6}{5}x + \frac{7}{5}$

D) $y = 5x - 7$

45) $x = 7y + 6$

A) $y = \frac{1}{7}x - \frac{6}{7}$

B) $y = 7x - 6$

C) $y = \frac{1}{7}x - 6$

D) $y = x - \frac{6}{7}$

7 Identify the Slope and y-Intercept of a Line from Its Equation

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the slope and y-intercept of the line.

46) $y = 2x + 5$

A) slope = 2; y-intercept = 5

B) slope = 5; y-intercept = 2

C) slope = $\frac{1}{2}$; y-intercept = - 5

D) slope = - 2; y-intercept = - 5

47) $x + y = 2$

A) slope = -1; y-intercept = 2

B) slope = 1; y-intercept = 2

C) slope = 0; y-intercept = 2

D) slope = -1; y-intercept = -2

48) $8x + y = -4$

A) slope = -8; y-intercept = -4

B) slope = $-\frac{1}{8}$; y-intercept = $-\frac{1}{2}$

C) slope = 8; y-intercept = -4

D) slope = - 2; y-intercept = $-\frac{1}{4}$

49) $-4x + 7y = 5$

A) slope = $\frac{4}{7}$; y-intercept = $\frac{5}{7}$

B) slope = 4; y-intercept = 12

C) slope = $\frac{12}{7}$; y-intercept = $\frac{5}{7}$

D) slope = $\frac{7}{4}$; y-intercept = $-\frac{5}{4}$

50) $9x + 2y = 3$

A) slope = $-\frac{9}{2}$; y-intercept = $\frac{3}{2}$

B) slope = $\frac{9}{2}$; y-intercept = $\frac{3}{2}$

C) slope = 9; y-intercept = 3

D) slope = $\frac{9}{2}$; y-intercept = $-\frac{3}{2}$

51) $4x - 7y = 5$

A) slope = $\frac{4}{7}$; y-intercept = $-\frac{5}{7}$

C) slope = $\frac{7}{4}$; y-intercept = $\frac{5}{4}$

B) slope = $\frac{4}{7}$; y-intercept = $\frac{5}{7}$

D) slope = 4; y-intercept = 5

52) $2x - 7y = 14$

A) slope = $\frac{2}{7}$; y-intercept = -2

C) slope = $\frac{7}{2}$; y-intercept = 7

B) slope = $-\frac{2}{7}$; y-intercept = 2

D) slope = 2; y-intercept = 14

53) $x + 9y = 1$

A) slope = $-\frac{1}{9}$; y-intercept = $\frac{1}{9}$

C) slope = $\frac{1}{9}$; y-intercept = $\frac{1}{9}$

B) slope = 1; y-intercept = 1

D) slope = -9; y-intercept = 9

54) $-x + 3y = 24$

A) slope = $\frac{1}{3}$; y-intercept = 8

C) slope = -1; y-intercept = 24

B) slope = $-\frac{1}{3}$; y-intercept = 8

D) slope = 3; y-intercept = -24

55) $y = -11$

A) slope = 0; y-intercept = -11

C) slope = 1; y-intercept = -11

B) slope = -11; y-intercept = 0

D) slope = 0; no y-intercept

56) $x = -4$

A) slope undefined; no y-intercept

C) slope = -4; y-intercept = 0

B) slope = 0; y-intercept = -4

D) slope undefined; y-intercept = -4

57) $y = -4x$

A) slope = -4; y-intercept = 0

C) slope = $-\frac{1}{4}$; y-intercept = 0

B) slope = 4; y-intercept = 0

D) slope = 0; y-intercept = -4

Solve the problem.

58) A truck rental company rents a moving truck one day by charging \$25 plus \$0.07 per mile. Write a linear equation that relates the cost C , in dollars, of renting the truck to the number x of miles driven. What is the cost of renting the truck if the truck is driven 180 miles?

A) $C = 0.07x + 25$; \$37.60

C) $C = 0.07x + 25$; \$26.26

B) $C = 25x + 0.07$; \$4500.07

D) $C = 0.07x - 25$; \$12.40

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

59) Each week a soft drink machine sells x cans of soda for \$0.75/soda. The cost to the owner of the soda machine for each soda is \$0.10. The weekly fixed cost for maintaining the soda machine is \$25/week. Write an equation that relates the weekly profit, P , in dollars to the number of cans sold each week. Then use the equation to find the weekly profit when 92 cans of soda are sold in a week.

- 60) Each day the commuter train transports x passengers to or from the city at \$1.75/passenger. The daily fixed cost for running the train is \$1200. Write an equation that relates the daily profit, P , in dollars to the number of passengers each day. Then use the equation to find the daily profit when the train has 920 passengers in a day.
- 61) Each month a beauty salon gives x manicures for \$12.00/manicure. The cost to the owner of the beauty salon for each manicure is \$7.35. The monthly fixed cost to maintain a manicure station is \$120.00. Write an equation that relates the monthly profit, in dollars, to the number of manicures given each month. Then use the equation to find the monthly profit when 200 manicures are given in a month.
- 62) Each month a gas station sells x gallons of gas at \$1.92/gallon. The cost to the owner of the gas station for each gallon of gas is \$1.32. The monthly fixed cost for running the gas station is \$37,000. Write an equation that relates the monthly profit, in dollars, to the number of gallons of gasoline sold. Then use the equation to find the monthly profit when 75,000 gallons of gas are sold in a month.

8 Graph Lines Written in General Form Using Intercepts

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the general form of the equation for the line with the given properties.

63) Slope = $\frac{2}{5}$; y-intercept = $\frac{6}{5}$

A) $2x - 5y = -6$

B) $2x + 5y = -6$

C) $y = \frac{2}{5}x + \frac{6}{5}$

D) $y = \frac{2}{5}x - \frac{6}{5}$

64) Slope = $-\frac{2}{3}$; containing the point (5, 2)

A) $2x + 3y = 16$

B) $2x - 3y = 16$

C) $2x + 3y = -16$

D) $3x + 2y = -16$

65) Slope = $-\frac{4}{9}$; containing the point (0, 5)

A) $4x + 9y = 45$

B) $4x - 9y = 45$

C) $4x + 9y = -45$

D) $9x + 4y = -45$

66) Slope = $\frac{4}{5}$; containing (0, 2)

A) $-4x + 5y = 10$

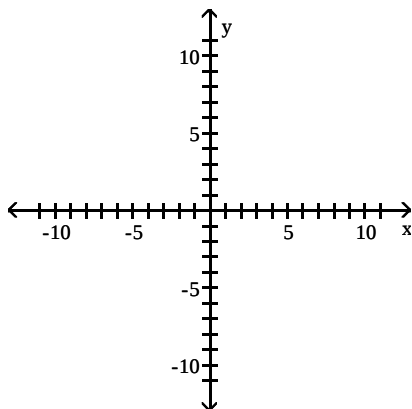
B) $-4x - 5y = 10$

C) $-4x + 5y = -10$

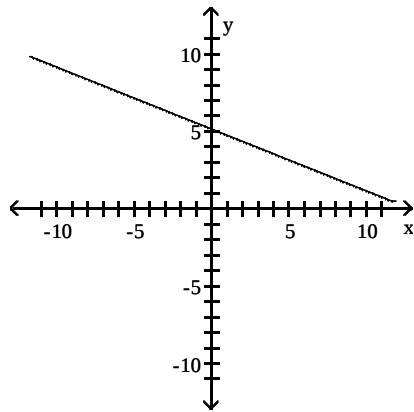
D) $5x - 4y = -10$

Find the slope of the line and sketch its graph.

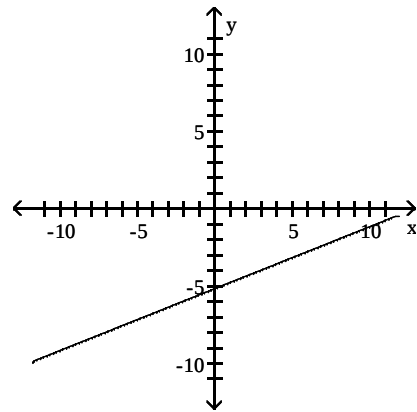
67) $2x + 5y = 26$



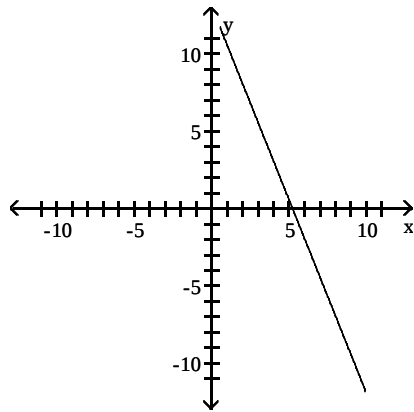
A) slope = $-\frac{2}{5}$



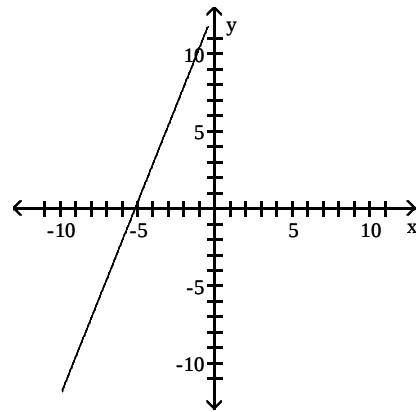
B) slope = $\frac{2}{5}$



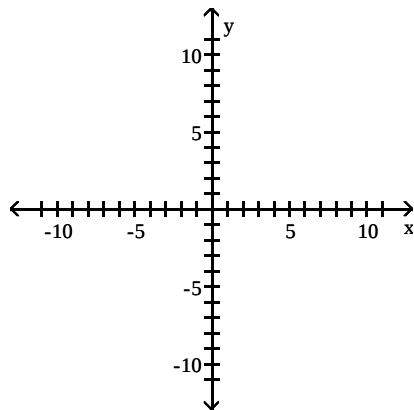
C) slope = $-\frac{5}{2}$



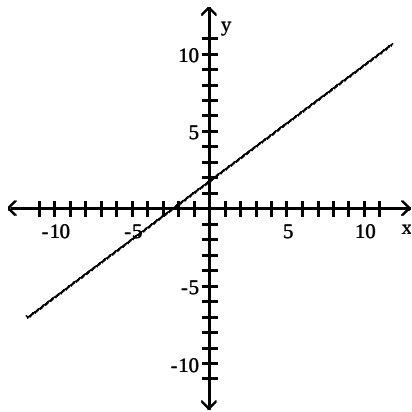
D) slope = $\frac{5}{2}$



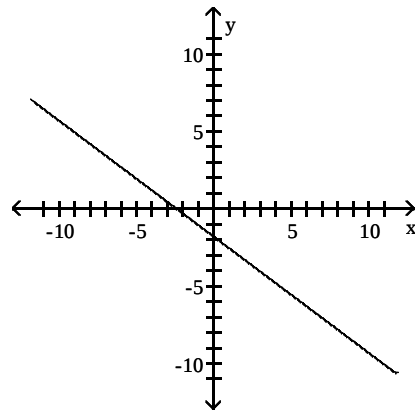
68) $3x - 4y = -7$



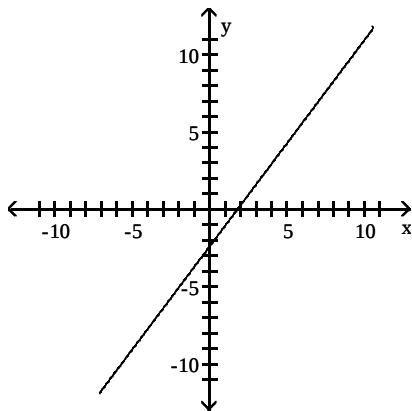
A) slope = $\frac{3}{4}$



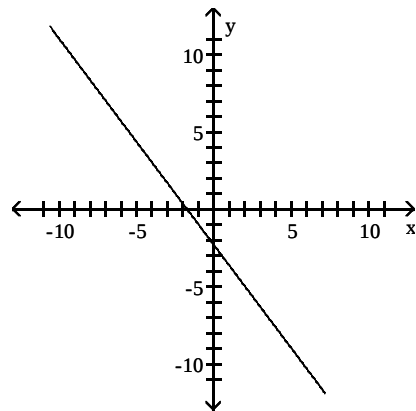
B) slope = $-\frac{3}{4}$



C) slope = $\frac{4}{3}$

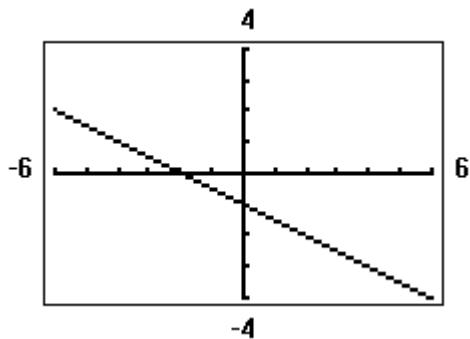


D) slope = $-\frac{4}{3}$



Solve the problem.

69) Find an equation in general form for the line graphed on a graphing utility.



A) $x + 2y = -2$

B) $y = -\frac{1}{2}x - 1$

C) $2x + y = -1$

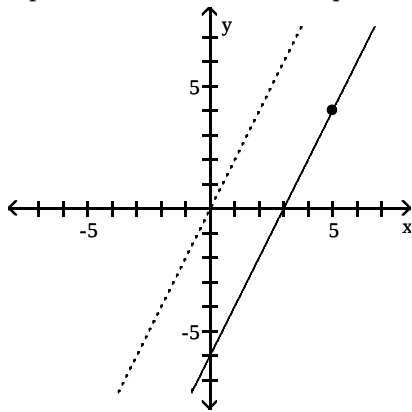
D) $y = -2x - 1$

9 Find Equations of Parallel Lines

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find an equation for the line with the given properties.

- 70) The solid line L contains the point (5, 4) and is parallel to the dotted line whose equation is $y = 2x$. Give the equation for the line L in slope-intercept form.



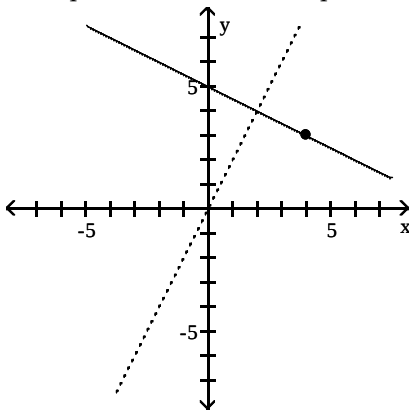
- A) $y = 2x - 6$ B) $y = 2x - 1$ C) $y - 4 = 2(x - 5)$ D) $y = 2x + b$
- 71) Parallel to the line $y = -4x$; containing the point (4, 8)
 A) $y = -4x + 24$ B) $y = -4x - 24$ C) $y - 8 = -4x - 4$ D) $y = -4x$
- 72) Parallel to the line $x + 5y = 8$; containing the point (0, 0)
 A) $y = -\frac{1}{5}x$ B) $y = -\frac{1}{5}x + 8$ C) $y = \frac{7}{5}$ D) $y = \frac{1}{5}x$
- 73) Parallel to the line $5x - y = 7$; containing the point (0, 0)
 A) $y = 5x$ B) $y = -\frac{1}{5}x + 7$ C) $y = -\frac{1}{5}x$ D) $y = \frac{1}{5}x$
- 74) Parallel to the line $y = -3$; containing the point (1, 6)
 A) $y = 6$ B) $y = -6$ C) $y = -3$ D) $y = 1$
- 75) Parallel to the line $x = -5$; containing the point (7, 8)
 A) $x = 7$ B) $x = 8$ C) $y = -5$ D) $y = 8$
- 76) Parallel to the line $9x + 2y = 35$; containing the point (3, 3)
 A) $9x + 2y = 33$ B) $9x - 2y = 33$ C) $2x + 9y = 3$ D) $3x + 2y = 35$
- 77) Parallel to the line $-5x + 6y = 2$; x-intercept = 2
 A) $-5x + 6y = -10$ B) $-5x + 6y = 12$ C) $6x + 5y = 12$ D) $6x + 5y = 10$

10 Find Equations of Perpendicular Lines

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find an equation for the line with the given properties.

- 78) The solid line L contains the point (4, 3) and is perpendicular to the dotted line whose equation is $y = 2x$. Give the equation of line L in slope-intercept form.



- A) $y = -\frac{1}{2}x + 5$ B) $y - 3 = -\frac{1}{2}(x - 4)$ C) $y = \frac{1}{2}x + 5$ D) $y - 3 = 2(x - 4)$
- 79) Perpendicular to the line $y = -4x + 1$; containing the point (1, -2)
- A) $y = \frac{1}{4}x - \frac{9}{4}$ B) $y = -\frac{1}{4}x - \frac{9}{4}$ C) $y = 4x - \frac{9}{4}$ D) $y = -4x - \frac{9}{4}$
- 80) Perpendicular to the line $y = \frac{1}{8}x + 9$; containing the point (4, -2)
- A) $y = -8x + 30$ B) $y = 8x - 30$ C) $y = -8x - 30$ D) $y = -\frac{1}{8}x - \frac{15}{4}$
- 81) Perpendicular to the line $2x - y = 4$; containing the point (0, 2)
- A) $y = -\frac{1}{2}x + 2$ B) $y = -\frac{1}{2}x + 4$ C) $y = \frac{3}{2}$ D) $y = \frac{1}{2}x + 2$
- 82) Perpendicular to the line $x - 9y = 4$; containing the point (4, 3)
- A) $y = -9x + 39$ B) $y = 9x - 39$ C) $y = -9x - 39$ D) $y = -\frac{1}{9}x - \frac{13}{3}$
- 83) Perpendicular to the line $y = -8$; containing the point (6, 1)
- A) $x = 6$ B) $x = 1$ C) $y = 6$ D) $y = 1$
- 84) Perpendicular to the line $x = -5$; containing the point (6, 3)
- A) $y = 3$ B) $x = 3$ C) $y = 6$ D) $x = 6$
- 85) Perpendicular to the line $7x - 5y = 7$; containing the point (6, -7)
- A) $5x + 7y = -19$ B) $5x - 7y = -19$ C) $7x + 5 = 7$ D) $6x + 5y = 7$
- 86) Perpendicular to the line $-9x + 8y = -47$; containing the point (7, 9)
- A) $8x + 9y = 137$ B) $8x - 9y = 137$ C) $-9x - 8y = 137$ D) $8x - 9y = -47$
- 87) Perpendicular to the line $-3x - 5y = -4$; y-intercept = -3
- A) $-5x + 3y = -9$ B) $-3x - 5y = 15$ C) $-5x + 3y = 15$ D) $-3x - 5y = 9$

Decide whether the pair of lines is parallel, perpendicular, or neither.

88) $3x - 4y = -14$

$8x + 6y = -6$

A) parallel

B) perpendicular

C) neither

89) $3x - 6y = -20$

$18x + 9y = -16$

A) parallel

B) perpendicular

C) neither

90) $9x + 3y = 12$

$24x + 8y = 33$

A) parallel

B) perpendicular

C) neither

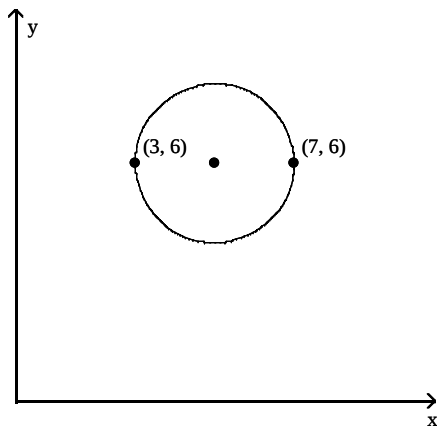
0.4 Circles

1 Write the Standard Form of the Equation of a Circle

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Write the standard form of the equation of the circle.

1)



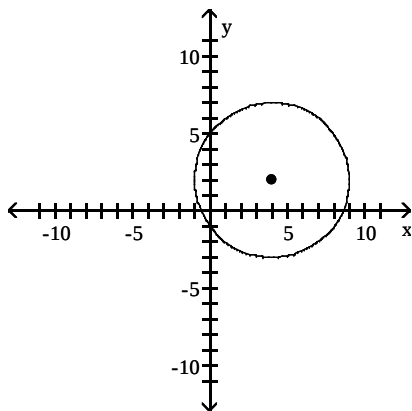
A) $(x - 5)^2 + (y - 6)^2 = 4$

B) $(x - 5)^2 + (y - 6)^2 = 2$

C) $(x + 5)^2 + (y + 6)^2 = 4$

D) $(x + 5)^2 + (y + 6)^2 = 2$

2)



A) $(x - 4)^2 + (y - 2)^2 = 25$

B) $(x + 4)^2 + (y + 2)^2 = 25$

C) $(x - 2)^2 + (y - 4)^2 = 25$

D) $(x + 2)^2 + (y + 4)^2 = 25$

Write the standard form of the equation of the circle with radius r and center (h, k) .

3) $r = 3$; $(h, k) = (0, 0)$

A) $x^2 + y^2 = 9$

C) $(x - 3)^2 + (y - 3)^2 = 9$

B) $x^2 + y^2 = 3$

D) $(x - 3)^2 + (y - 3)^2 = 3$

4) $r = 8$; $(h, k) = (-4, -10)$

A) $(x + 4)^2 + (y + 10)^2 = 64$

C) $(x + 4)^2 + (y + 10)^2 = 8$

B) $(x - 4)^2 + (y - 10)^2 = 64$

D) $(x - 4)^2 + (y - 10)^2 = 8$

5) $r = 8$; $(h, k) = (10, 0)$

A) $(x - 10)^2 + y^2 = 64$

B) $(x + 10)^2 + y^2 = 64$

C) $x^2 + (y - 10)^2 = 8$

D) $x^2 + (y + 10)^2 = 8$

6) $r = 2$; $(h, k) = (0, 2)$

A) $x^2 + (y - 2)^2 = 4$

B) $x^2 + (y + 2)^2 = 2$

C) $(x - 2)^2 + y^2 = 4$

D) $(x + 2)^2 + y^2 = 4$

7) $r = \sqrt{15}$; $(h, k) = (8, 7)$

A) $(x - 8)^2 + (y - 7)^2 = 15$

C) $(x - 7)^2 + (y - 8)^2 = 225$

B) $(x + 8)^2 + (y + 7)^2 = 15$

D) $(x + 7)^2 + (y + 8)^2 = 225$

8) $r = \sqrt{5}$; $(h, k) = (0, 2)$

A) $x^2 + (y - 2)^2 = 5$

B) $x^2 + (y + 2)^2 = 5$

C) $(x - 2)^2 + y^2 = 25$

D) $(x + 2)^2 + y^2 = 25$

Solve the problem.

9) Find the equation of a circle in standard form where $C(6, -2)$ and $D(-4, 4)$ are endpoints of a diameter.

A) $(x - 1)^2 + (y - 1)^2 = 34$

B) $(x + 1)^2 + (y + 1)^2 = 34$

C) $(x - 1)^2 + (y - 1)^2 = 136$

D) $(x + 1)^2 + (y + 1)^2 = 136$

10) Find the equation of a circle in standard form with center at the point $(-3, 2)$ and tangent to the line $y = 4$.

A) $(x + 3)^2 + (y - 2)^2 = 4$

B) $(x + 3)^2 + (y - 2)^2 = 16$

C) $(x - 3)^2 + (y + 2)^2 = 4$

D) $(x - 3)^2 + (y + 2)^2 = 16$

11) Find the equation of a circle in standard form that is tangent to the line $x = -3$ at $(-3, 5)$ and also tangent to the line $x = 9$.

A) $(x - 3)^2 + (y - 5)^2 = 36$

B) $(x + 3)^2 + (y - 5)^2 = 36$

C) $(x - 3)^2 + (y + 5)^2 = 36$

D) $(x + 3)^2 + (y + 5)^2 = 36$

Find the center (h, k) and radius r of the circle with the given equation.

12) $x^2 + y^2 = 16$

A) $(h, k) = (0, 0)$; $r = 4$

C) $(h, k) = (4, 4)$; $r = 4$

B) $(h, k) = (0, 0)$; $r = 16$

D) $(h, k) = (4, 4)$; $r = 16$

13) $(x - 2)^2 + (y + 9)^2 = 36$

A) $(h, k) = (2, -9)$; $r = 6$

C) $(h, k) = (-9, 2)$; $r = 6$

B) $(h, k) = (2, -9)$; $r = 36$

D) $(h, k) = (-9, 2)$; $r = 36$

14) $(x + 9)^2 + y^2 = 36$

A) $(h, k) = (-9, 0)$; $r = 6$

C) $(h, k) = (0, -9)$; $r = 36$

B) $(h, k) = (0, -9)$; $r = 6$

D) $(h, k) = (-9, 0)$; $r = 36$

15) $x^2 + (y + 10)^2 = 144$

A) $(h, k) = (0, -10); r = 12$

C) $(h, k) = (-10, 0); r = 144$

B) $(h, k) = (-10, 0); r = 12$

D) $(h, k) = (0, -10); r = 144$

16) $2(x - 3)^2 + 2(y - 6)^2 = 26$

A) $(h, k) = (3, 6); r = \sqrt{13}$

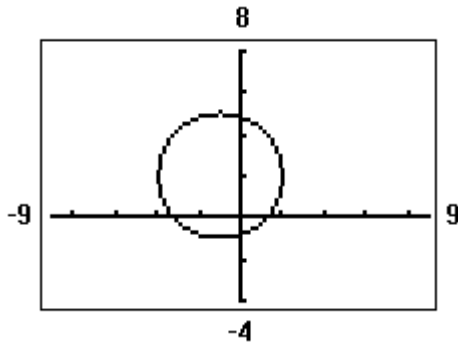
C) $(h, k) = (-3, -6); r = \sqrt{13}$

B) $(h, k) = (3, 6); r = 2\sqrt{13}$

D) $(h, k) = (-3, -6); r = 2\sqrt{13}$

Solve the problem.

- 17) Find the standard form of the equation of the circle. Assume that the center has integer coordinates and the radius is an integer.



A) $(x + 1)^2 + (y - 2)^2 = 9$

C) $x^2 + y^2 + 2x - 4y - 4 = 0$

B) $(x - 1)^2 + (y + 2)^2 = 9$

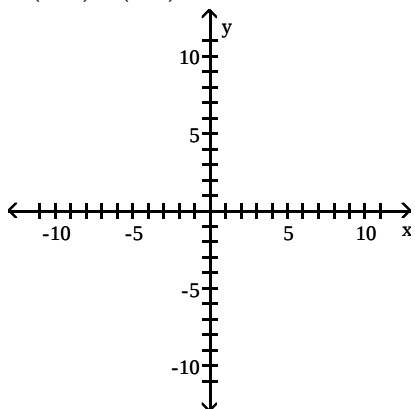
D) $x^2 + y^2 - 2x + 4y - 4 = 0$

2 Graph a Circle

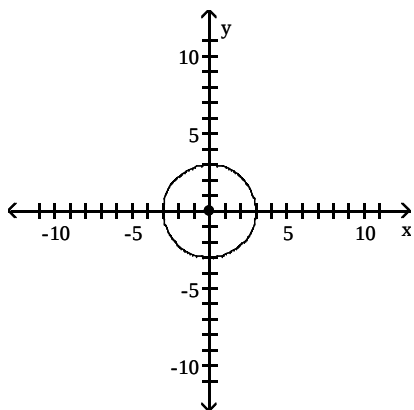
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the circle with radius r and center (h, k) .

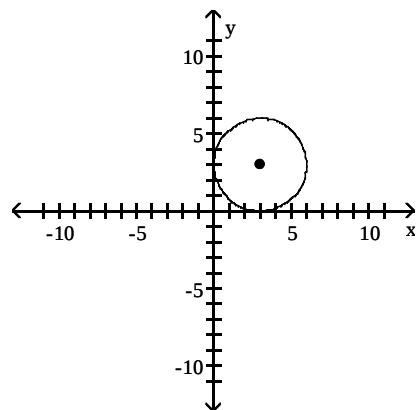
18) $r = 3$; $(h, k) = (0, 0)$



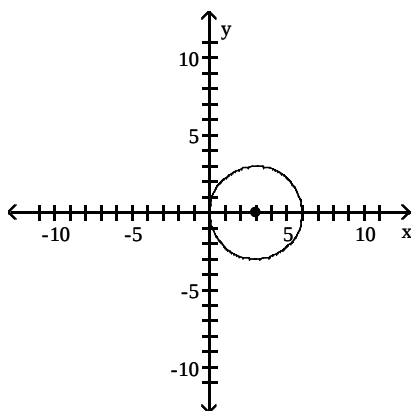
A)



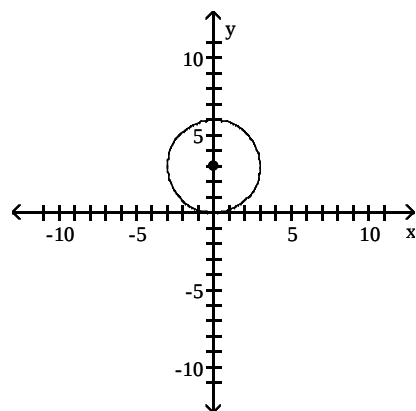
B)



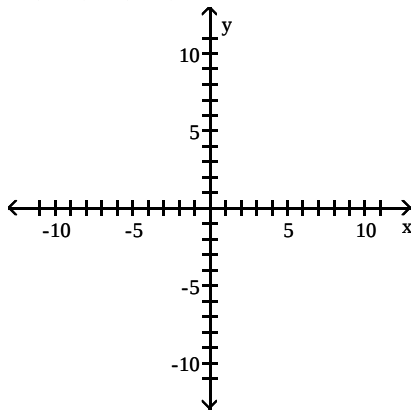
C)



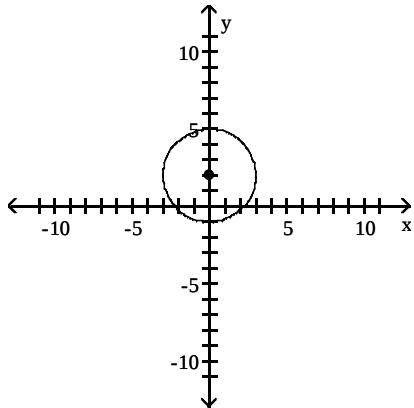
D)



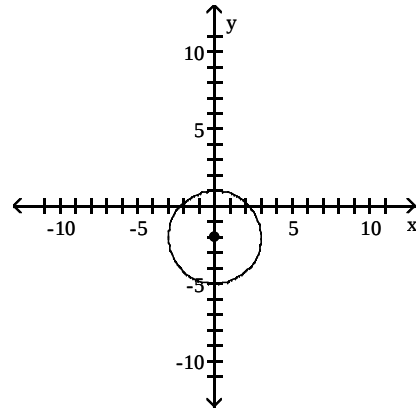
19) $r = 3$; $(h, k) = (0, 2)$



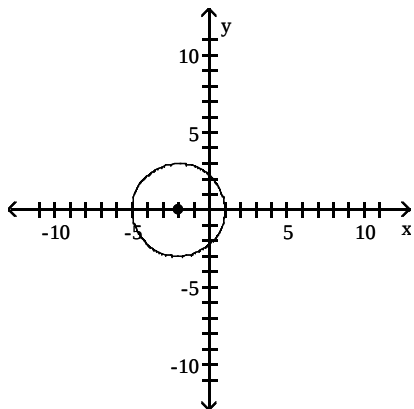
A)



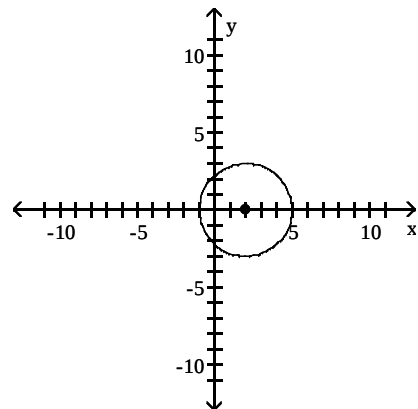
B)



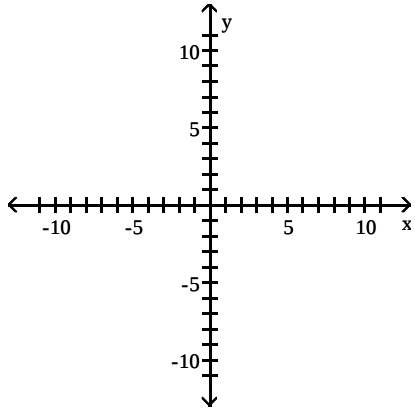
C)



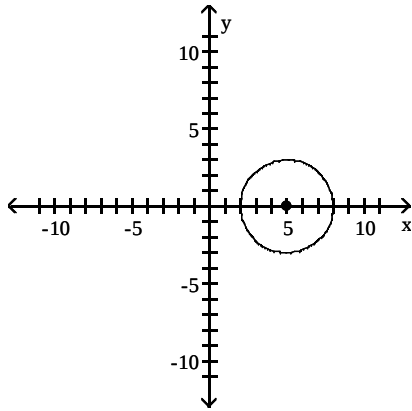
D)



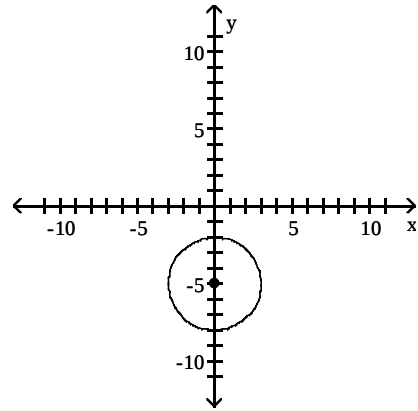
20) $r = 3$; $(h, k) = (5, 0)$



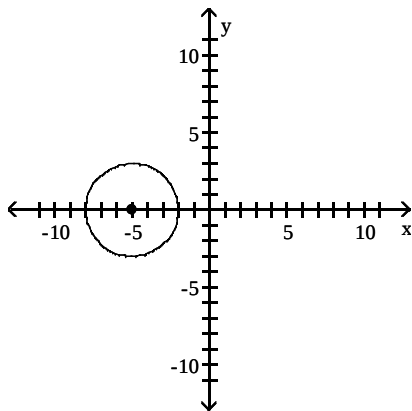
A)



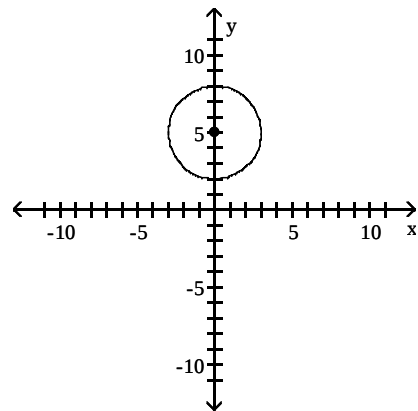
B)



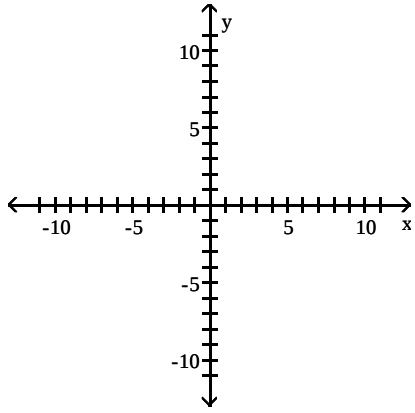
C)



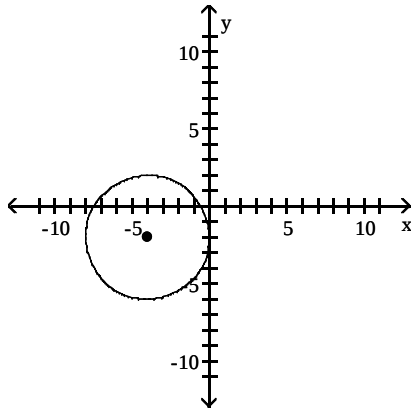
D)



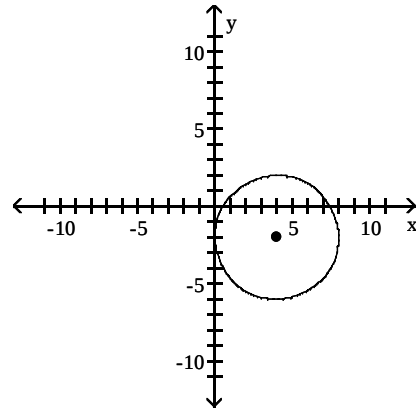
21) $r = 4$; $(h, k) = (-4, -2)$



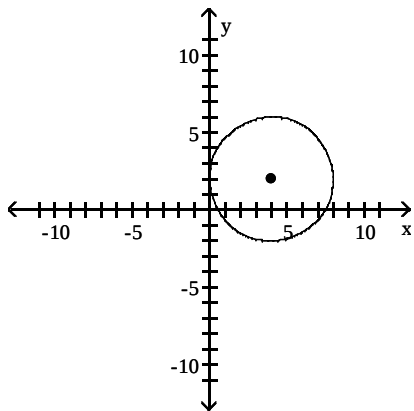
A)



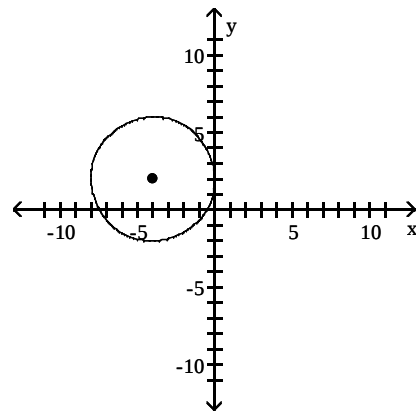
B)



C)

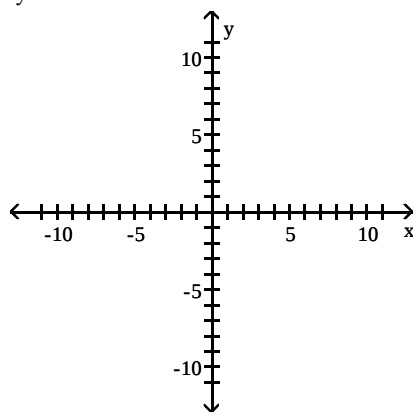


D)

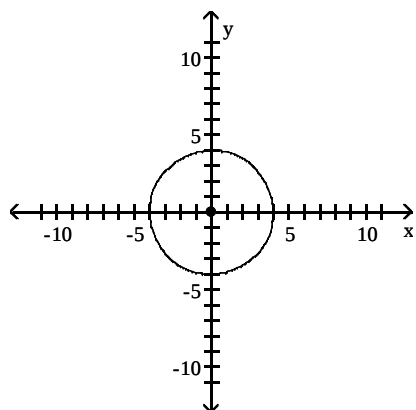


Graph the equation.

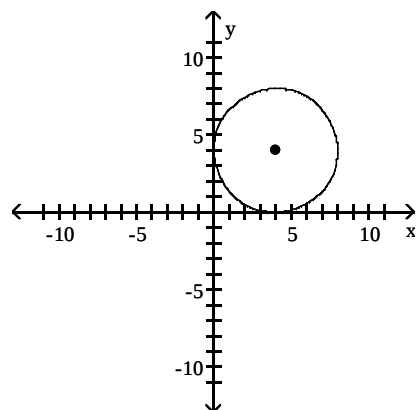
22) $x^2 + y^2 = 16$



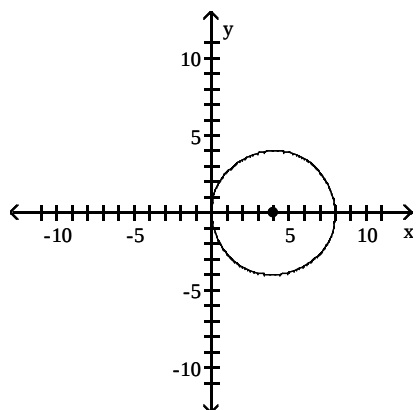
A)



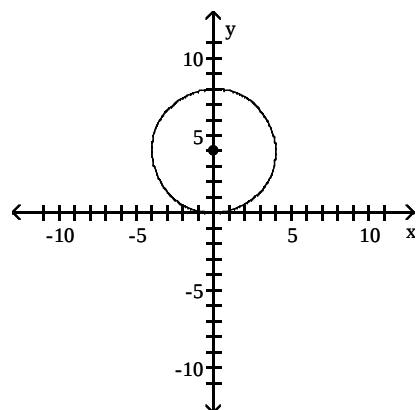
B)



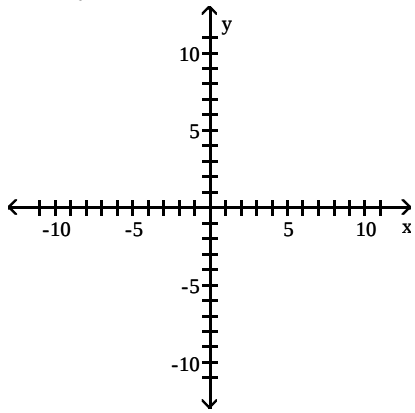
C)



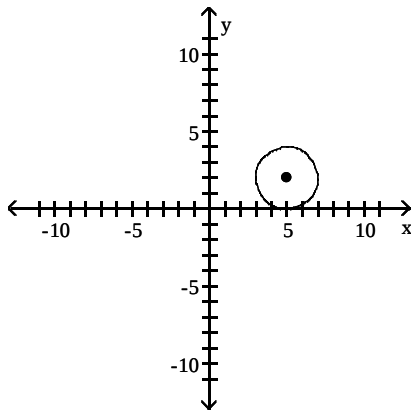
D)



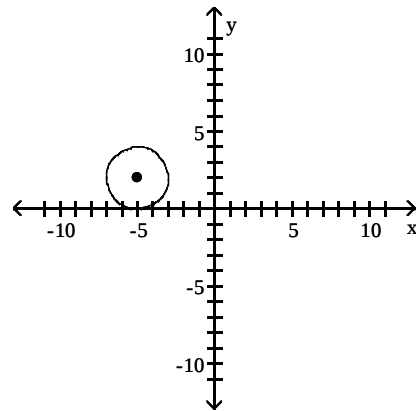
23) $(x - 5)^2 + (y - 2)^2 = 4$



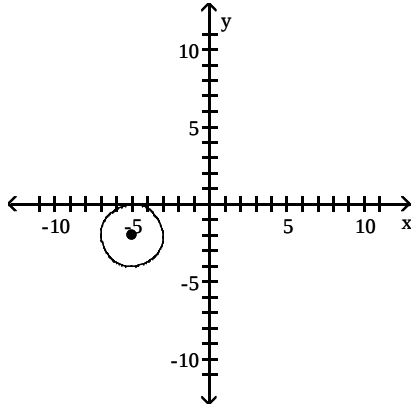
A)



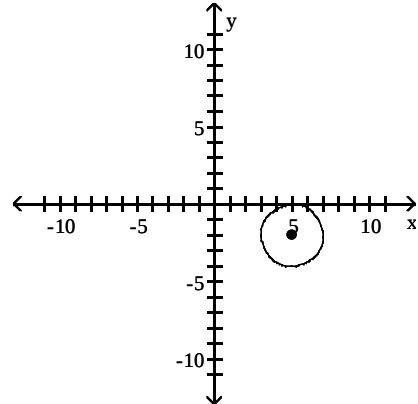
B)



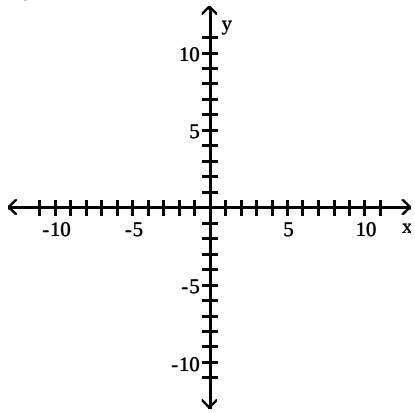
C)



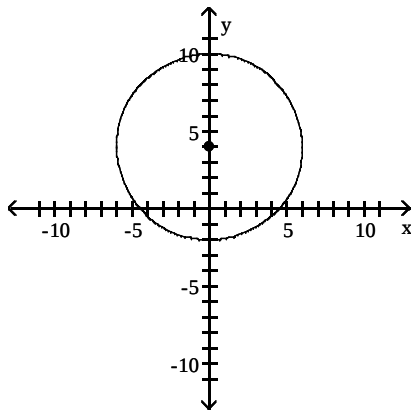
D)



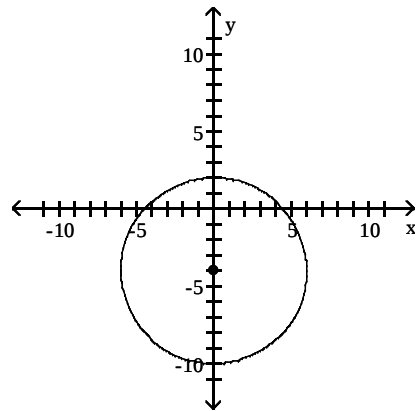
24) $x^2 + (y - 4)^2 = 36$



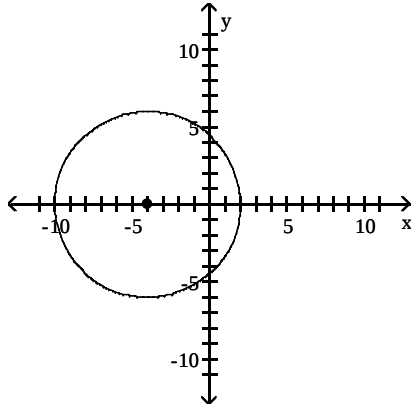
A)



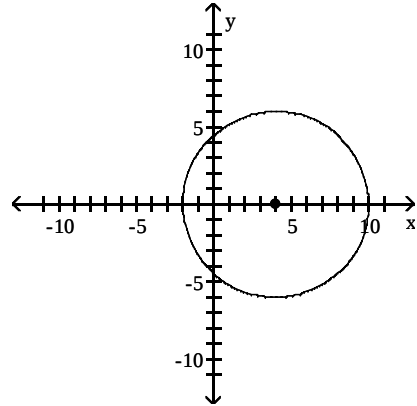
B)



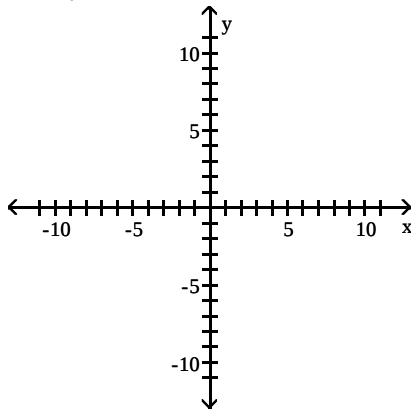
C)



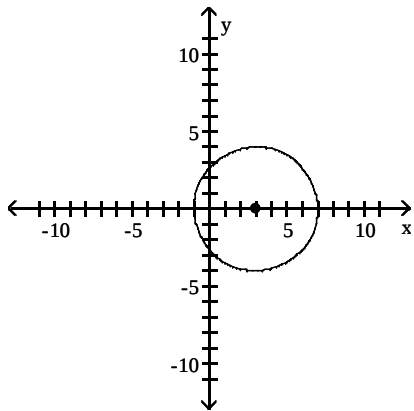
D)



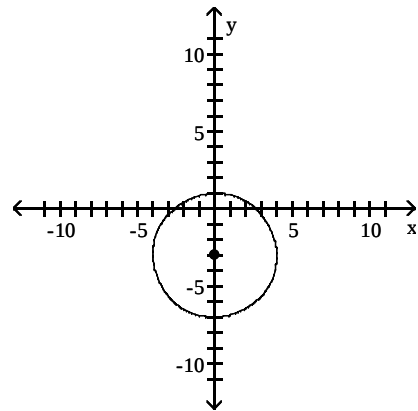
25) $(x - 3)^2 + y^2 = 16$



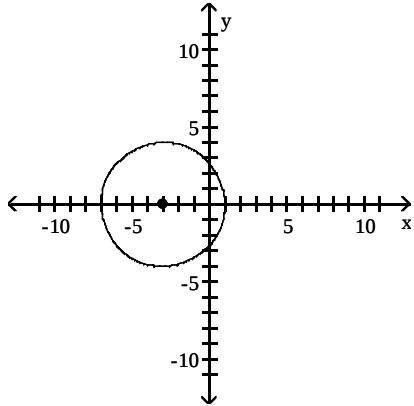
A)



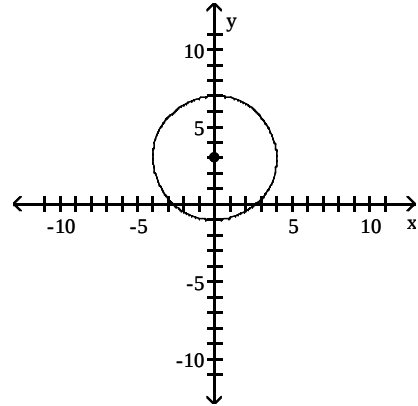
B)



C)



D)

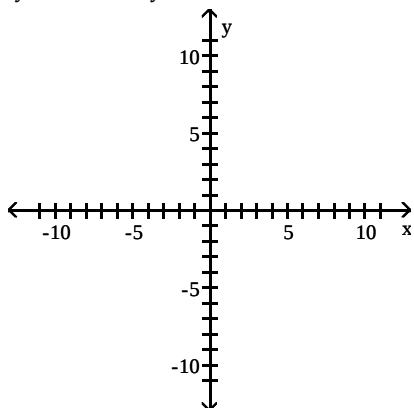


3 Work with the General Form of the Equation of a Circle

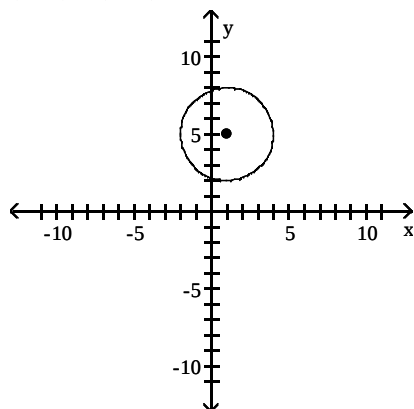
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the center (h, k) and radius r of the circle. Graph the circle.

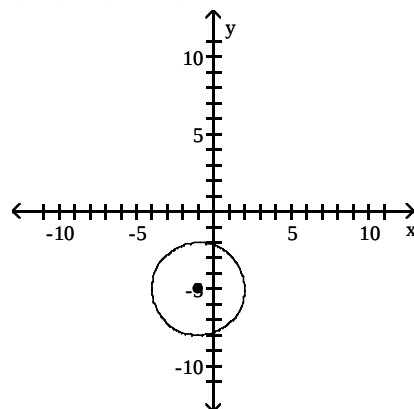
26) $x^2 + y^2 - 2x - 10y + 17 = 0$



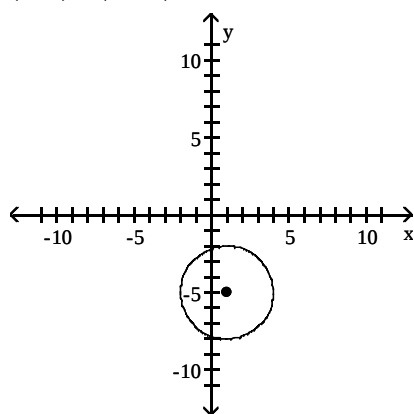
A) $(h, k) = (1, 5); r = 3$



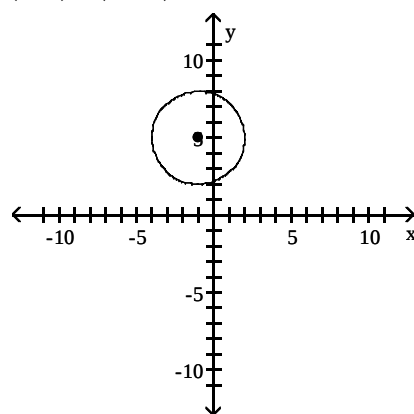
B) $(h, k) = (-1, -5); r = 3$



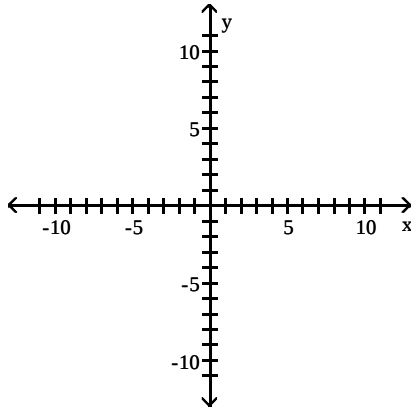
C) $(h, k) = (1, -5); r = 3$



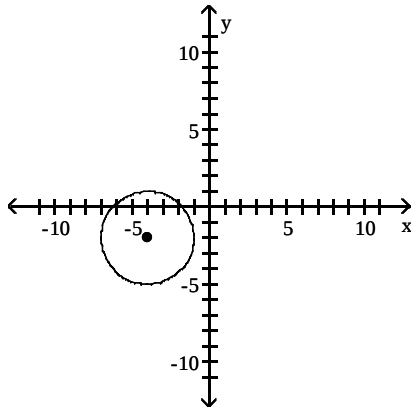
D) $(h, k) = (-1, 5); r = 3$



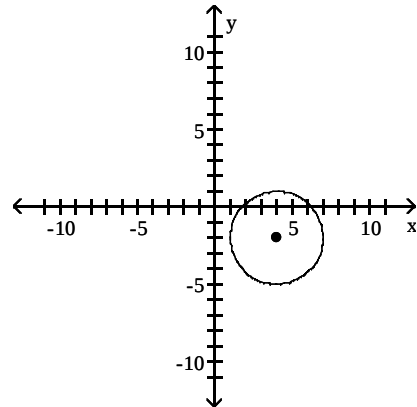
27) $x^2 + y^2 + 8x + 4y + 11 = 0$



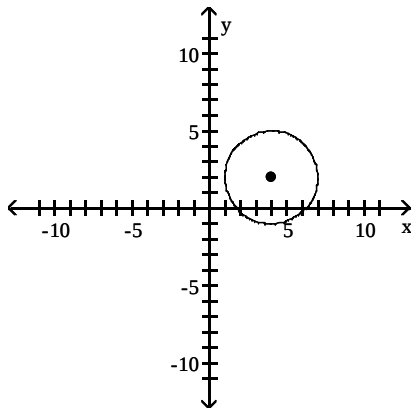
A) $(h, k) = (-4, -2); r = 3$



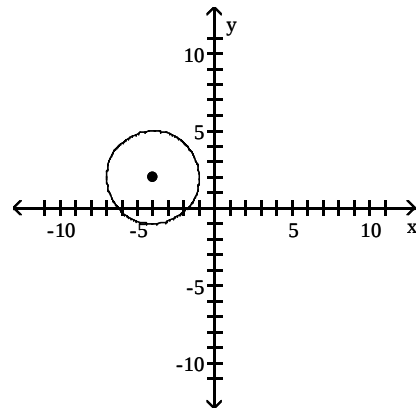
B) $(h, k) = (4, -2); r = 3$



C) $(h, k) = (4, 2); r = 3$



D) $(h, k) = (-4, 2); r = 3$



Find the center (h, k) and radius r of the circle with the given equation.

28) $x^2 + 6x + 9 + (y - 6)^2 = 49$

A) $(h, k) = (-3, 6); r = 7$

C) $(h, k) = (3, -6); r = 49$

B) $(h, k) = (6, -3); r = 7$

D) $(h, k) = (-6, 3); r = 49$

29) $x^2 - 12x + 36 + y^2 - 4y + 4 = 64$

A) $(h, k) = (6, 2); r = 8$

C) $(h, k) = (-6, -2); r = 64$

B) $(h, k) = (2, 6); r = 8$

D) $(h, k) = (-2, -6); r = 64$

30) $x^2 + y^2 - 14x + 16y + 113 = 25$

A) $(h, k) = (7, -8); r = 5$

C) $(h, k) = (-7, 8); r = 25$

B) $(h, k) = (-8, 7); r = 5$

D) $(h, k) = (8, -7); r = 25$

31) $x^2 + y^2 + 12x - 12y = -36$

A) $(h, k) = (-6, 6); r = 6$

C) $(h, k) = (6, -6); r = 36$

B) $(h, k) = (6, -6); r = 6$

D) $(h, k) = (-6, 6); r = 36$

32) $4x^2 + 4y^2 - 12x + 16y - 5 = 0$

A) $(h, k) = (\frac{3}{2}, -2); r = \frac{\sqrt{30}}{2}$

C) $(h, k) = (\frac{3}{2}, -2); r = \frac{3\sqrt{5}}{2}$

B) $(h, k) = (-\frac{3}{2}, 2); r = \frac{\sqrt{30}}{2}$

D) $(h, k) = (-\frac{3}{2}, 2); r = \frac{3\sqrt{5}}{2}$

Find the general form of the equation of the circle.

33) Center at the point $(-4, -3)$; containing the point $(-3, 3)$

A) $x^2 + y^2 + 8x + 6y - 12 = 0$

C) $x^2 + y^2 - 6x + 6y - 12 = 0$

B) $x^2 + y^2 + 6x + 8y - 17 = 0$

D) $x^2 + y^2 + 6x - 6y - 17 = 0$

34) Center at the point $(2, -3)$; containing the point $(5, -3)$

A) $x^2 + y^2 - 4x + 6y + 4 = 0$

C) $x^2 + y^2 - 4x + 6y + 22 = 0$

B) $x^2 + y^2 + 4x - 6y + 4 = 0$

D) $x^2 + y^2 + 4x - 6y + 22 = 0$

35) Center at the point $(2, 4)$; tangent to x-axis

A) $x^2 + y^2 - 4x - 8y + 4 = 0$

C) $x^2 + y^2 + 4x + 8y + 4 = 0$

B) $x^2 + y^2 - 4x - 8y + 16 = 0$

D) $x^2 + y^2 - 4x - 8y + 36 = 0$

Solve the problem.

36) If a circle of radius 3 is made to roll along the x-axis, what is the equation for the path of the center of the circle?

A) $y = 3$

B) $y = 0$

C) $y = 6$

D) $x = 3$

37) Earth is represented on a map of the solar system so that its surface is a circle with the equation

$x^2 + y^2 + 6x + 10y - 4062 = 0$. A weather satellite circles 0.4 units above the Earth with the center of its circular orbit at the center of the Earth. Find the general form of the equation for the orbit of the satellite on this map.

A) $x^2 + y^2 + 6x + 10y - 4113.36 = 0$

B) $x^2 + y^2 + 6x + 10y - 29.84 = 0$

C) $x^2 + y^2 - 6x - 10y - 4113.36 = 0$

D) $x^2 + y^2 + 6x + 10y + 33.84 = 0$

38) Find an equation of the line containing the centers of the two circles

$x^2 + y^2 - 2x - 10y + 25 = 0$ and

$x^2 + y^2 - 8x - 2y + 13 = 0$

A) $4x + 3y - 19 = 0$

B) $6x - 5y - 19 = 0$

C) $4x - 3y - 19 = 0$

D) $-4x + 3y - 19 = 0$

Ch. 0 Foundations: A Prelude to Functions

Answer Key

0.1 The Distance and Midpoint Formulas

1 Use the Distance Formula

- 1) A
- 2) A
- 3) A
- 4) A
- 5) A
- 6) A
- 7) A
- 8) A
- 9) A
- 10) A
- 11) A
- 12) A
- 13) A
- 14) A
- 15) A
- 16) A
- 17) A
- 18) A
- 19) A
- 20) A
- 21) A
- 22) A
- 23) A
- 24) A
- 25) A
- 26) A
- 27) A
- 28) A
- 29) A
- 30) A
- 31) A
- 32) A
- 33) A
- 34) A

2 Use the Midpoint Formula

- 35) A
- 36) A
- 37) A
- 38) A
- 39) A
- 40) A
- 41) A
- 42) A
- 43) A
- 44) A
- 45) A

0.2 Graphs of Equations in Two Variables; Intercepts; Symmetry

1 Graph Equations by Plotting Points

- 1) A

- 2) A
- 3) A
- 4) A
- 5) A
- 6) A
- 7) A
- 8) A
- 9) A

2 Find Intercepts from a Graph

- 10) A
- 11) A
- 12) A
- 13) A
- 14) A
- 15) A
- 16) A

3 Find Intercepts from an Equation

- 17) A
- 18) A
- 19) A
- 20) A
- 21) A
- 22) A
- 23) A
- 24) A
- 25) A
- 26) A
- 27) A
- 28) A
- 29) A

4 Test an Equation for Symmetry

- 30) A
- 31) A
- 32) A
- 33) A
- 34) A
- 35) A
- 36) A
- 37) A
- 38) A
- 39) A
- 40) A
- 41) A
- 42) A
- 43) E
- 44) A
- 45) A
- 46) A
- 47) D
- 48) D
- 49) E
- 50) A
- 51) A
- 52) A

- 53) E
- 54) A
- 55) E
- 56) B
- 57) A

5 Know How to Graph Key Equations

- 58) A
- 59) A
- 60) A
- 61) A

0.3 Lines

1 Calculate and Interpret the Slope of a Line

- 1) A
- 2) A
- 3) A
- 4) A
- 5) A
- 6) A
- 7) A
- 8) A
- 9) D
- 10) A

2 Graph Lines Given a Point and the Slope

- 11) A
- 12) A
- 13) A
- 14) A
- 15) A
- 16) A
- 17) A
- 18) A
- 19) A

3 Find the Equation of a Vertical Line

- 20) A
- 21) A
- 22) A
- 23) A

4 Use the Point–Slope Form of a Line; Identify Horizontal Lines

- 24) A
- 25) A
- 26) A
- 27) A
- 28) A

5 Find the Equation of a Line Given Two Points

- 29) A
- 30) A
- 31) A
- 32) A
- 33) A
- 34) A
- 35) A
- 36) A
- 37) A

6 Write the Equation of a Line in Slope-Intercept Form

- 38) A
- 39) A
- 40) A
- 41) A
- 42) A
- 43) A
- 44) A
- 45) A

7 Identify the Slope and y-Intercept of a Line from Its Equation

- 46) A
- 47) A
- 48) A
- 49) A
- 50) A
- 51) A
- 52) A
- 53) A
- 54) A
- 55) A
- 56) A
- 57) A
- 58) A
- 59) $P = 0.65x - 25$; \$34.80
- 60) $P = 1.75x - 1200$; \$410
- 61) $P = 4.65x - 120$; \$810
- 62) $P = 0.60x - 37,000$; \$8000

8 Graph Lines Written in General Form Using Intercepts

- 63) A
- 64) A
- 65) A
- 66) A
- 67) A
- 68) A
- 69) A

9 Find Equations of Parallel Lines

- 70) A
- 71) A
- 72) A
- 73) A
- 74) A
- 75) A
- 76) A
- 77) A

10 Find Equations of Perpendicular Lines

- 78) A
- 79) A
- 80) A
- 81) A
- 82) A
- 83) A
- 84) A
- 85) A
- 86) A

- 87) A
- 88) B
- 89) B
- 90) A

0.4 Circles

1 Write the Standard Form of the Equation of a Circle

- 1) A
- 2) A
- 3) A
- 4) A
- 5) A
- 6) A
- 7) A
- 8) A
- 9) A
- 10) A
- 11) A
- 12) A
- 13) A
- 14) A
- 15) A
- 16) A
- 17) A

2 Graph a Circle

- 18) A
- 19) A
- 20) A
- 21) A
- 22) A
- 23) A
- 24) A
- 25) A

3 Work with the General Form of the Equation of a Circle

- 26) A
- 27) A
- 28) A
- 29) A
- 30) A
- 31) A
- 32) A
- 33) A
- 34) A
- 35) A
- 36) A
- 37) A
- 38) A