Math 102
Exam 2 Preparation Ch.2.1 to 2.5 v01
NO BOOK/ NO NOTES/YES CALCUATOR
Dressler Fall 2016

Name_____

Find the slope of the line passing through the pair of points or state that the slope is undefined.

1) (-8, 8) and (-5, 7) 1) _____

2) (7, -4) and (-1, 5) 2) _____

3) (9, 6) and (9, -4) 3) _____

4) (-4, –2) and (-4, 7) 4) _____

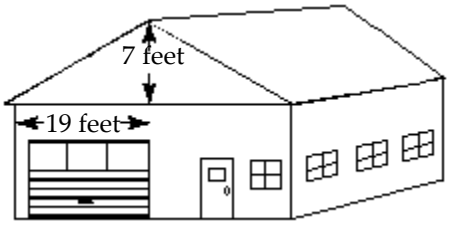
5) (–7, 3) and (9, 3) 5) _____

6) (4, 8) and (–9, 8) 6) _____

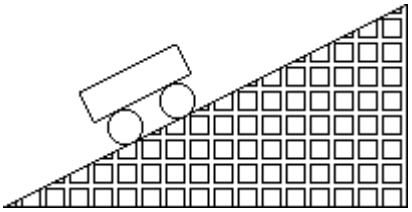
7) (–3, 1) and (–5, 1) 7) _____

Solve.

8) The pitch of a roof is its slope. Find the pitch of the roof shown. 8) _____



9) A section of roller coaster track has the dimensions shown in the diagram. Find the grade of the track, which is the slope written as a percent. 9) _____



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

10) $y = 4x + 5$ 10) _____
$y = -4x + 9$

11) $y = -3x + 5$ 11) _____
$y = 3x + 1$

12) $y = 2x + 2$ 12) _____
$y = -\frac{1}{2}x - 7$

13) $y = 2x + 2$
$y = -\frac{1}{2}x + 8$

13) _____

14) $y = 4x - 8$
$x - 4y = -1$

14) _____

15) $y = 3x + 9$
$x - 3y = -2$

15) _____

16) $3x - 4y = -16$
$8x + 6y = -14$

16) _____

17) $3x - 2y = 19$
$2x + 3y = -15$

17) _____

18) $12x + 4y = 16$
$15x + 5y = 22$

18) _____

19) $9x + 3y = 12$
$6x + 2y = 11$

19) _____

20) $3x - 2y = -15$
$4x + 3y = 15$

20) _____

Find an equation of the line that has the given slope and contains the given point.

21) m = 0, (-1, 6) 21) _____

22) m = 0, (3, 10) 22) _____

23) $m = \frac{7}{8}$, (3, 3) 23) _____

24) $m = \frac{5}{6}$, (2, 2) 24) _____

25) $m = -\frac{2}{5}$, (2, 3) 25) _____

26) $m = -\frac{3}{8}$, (5, 3) 26) _____

27) m = 0, (4, 7) 27) _____

28) $m = \frac{2}{3}$, (8, 4) 28) _____

Solve. Assume the exercise describes a linear relationship.

29) The average value of a certain type of automobile was $15,660 in 1991 and depreciated to $7740 in 1995. Let y be the average value of the automobile in the year x, where $x = 0$ represents 1991. Write a linear equation that models the value of the automobile in terms of the year x. 29) _____

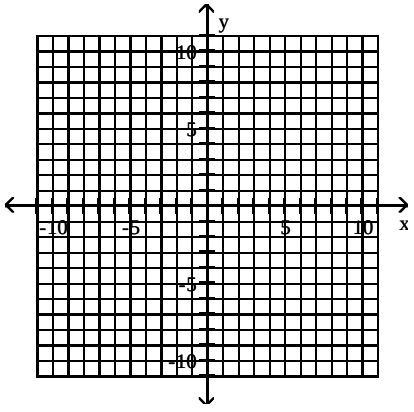
30) A faucet is used to add water to a large bottle that already contained some water. After it has been filling for 3 seconds, the gauge on the bottle indicates that it contains 11 ounces of water. After it has been filling for 10 seconds, the gauge indicates the bottle contains 32 ounces of water. Let y be the amount of water in the bottle x seconds after the faucet was turned on. Write a linear equation that models the amount of water in the bottle in terms of x. 30) _____

31) A vendor has learned that, by pricing hot dogs at $1.25, sales will reach 98 hot dogs per day. Raising the price to $1.75 will cause the sales to fall to 74 hot dogs per day. Let y be the number of hot dogs the vendor sells at x dollars each. Write a linear equation that models the number of hot dogs sold per day when the price is x dollars each. 31) _____

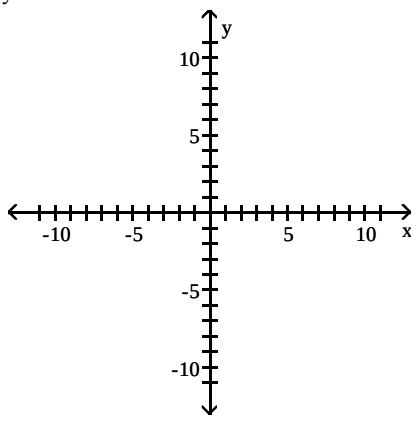
32) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of $2.25 as soon as you get in the taxi, to which a charge of $2.00 per mile is added. Find an equation that can be used to determine the cost of an x–mile taxi ride. Use this equation to find the cost of a 8–mile taxi ride. 32) _____

Graph the equation.

33) $y = x^2 - 2$ 33) _____

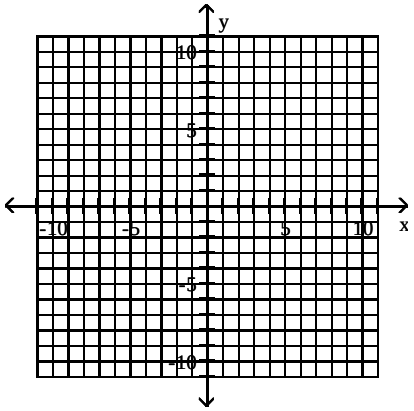


34) $x = y^2$ 34) _____

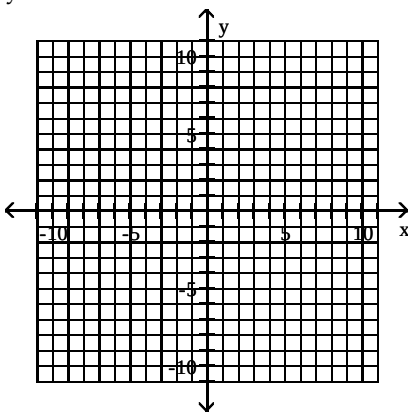


Graph the equation.

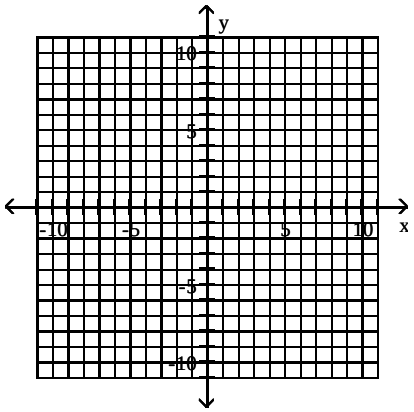
35) $y = x^2 + 4$ 35) _____



36) $y = 4|x|$ 36) _____

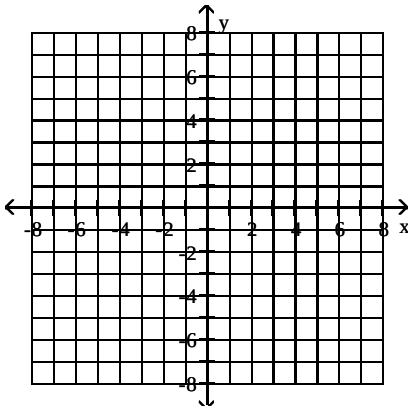


37) $y = -5|x|$ 37) _____

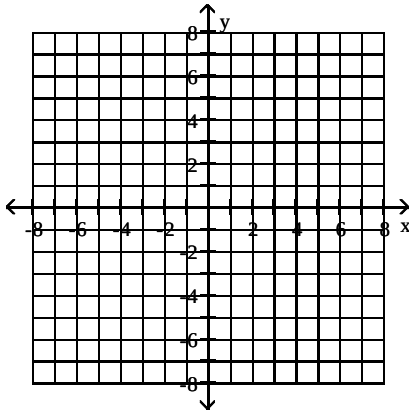


Write the English sentence as an equation in two variables. Then graph the equation.

38) The y–value is four decreased by the square of the x–value. 38) _____

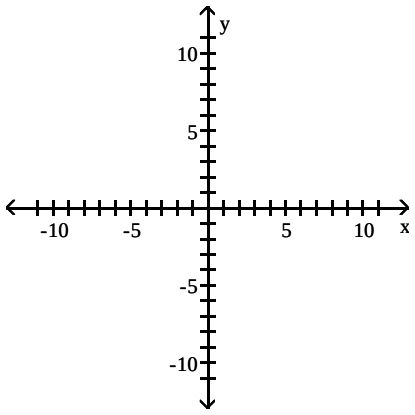


39) The y–value is seven decreased by the square of the x–value. 39) _____

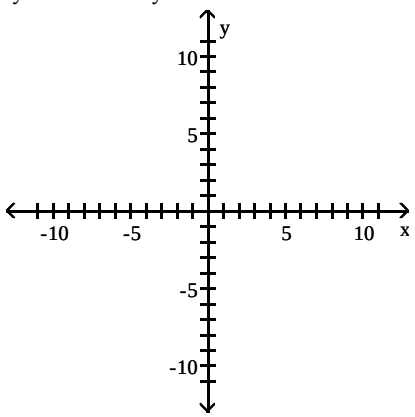


Find the center (h, k) and radius r of the circle. Graph the circle.

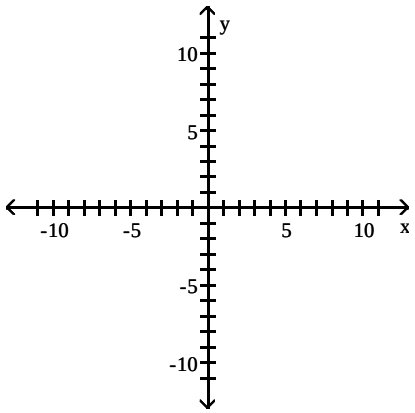
40) $x^2 + y^2 - 6x - 4y - 12 = 0$ 40) _____



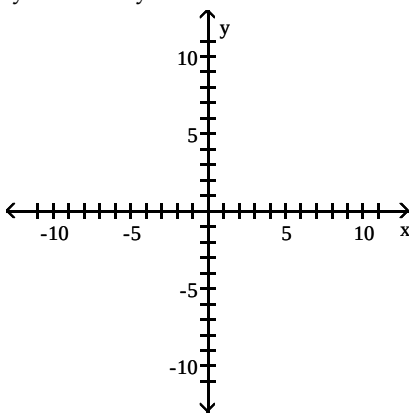
41) $x^2 + y^2 - 12x - 10y + 52 = 0$ 41) _____



42) $x^2 + y^2 + 4x + 2y - 20 = 0$ 42) _____

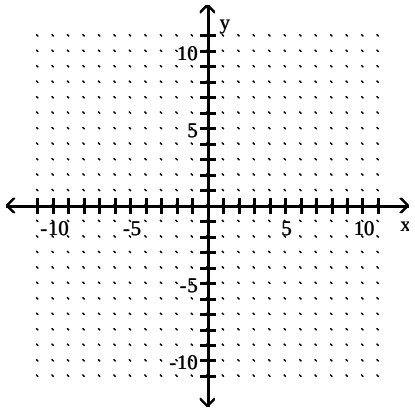


43) $x^2 + y^2 + 6x + 6y - 18 = 0$ 43) _____

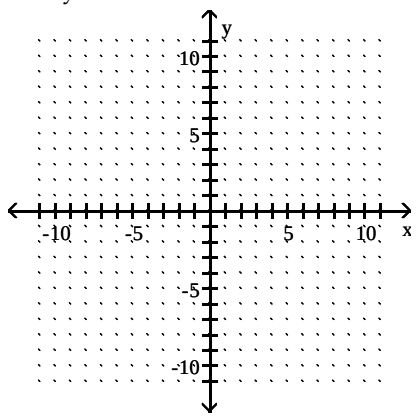


Complete the square and write the equation in standard form. Then give the center and radius of the circle and graph the equation.

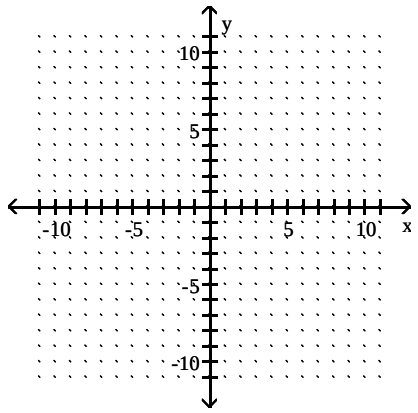
44) $x^2 + y^2 + 10x + 21 = 0$ 44) _____



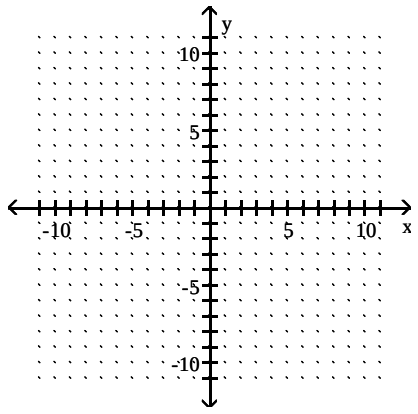
45) $x^2 + y^2 + 8x - 0 = 0$ 45) _____



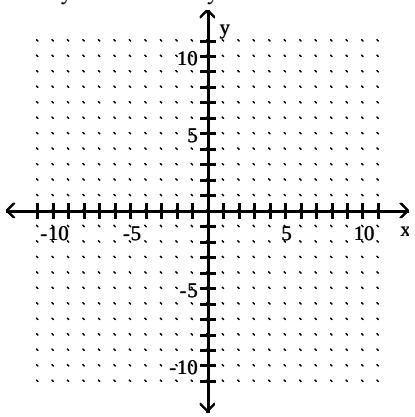
46) $x^2 + y^2 - 14x + 40 = 0$ 46) _____



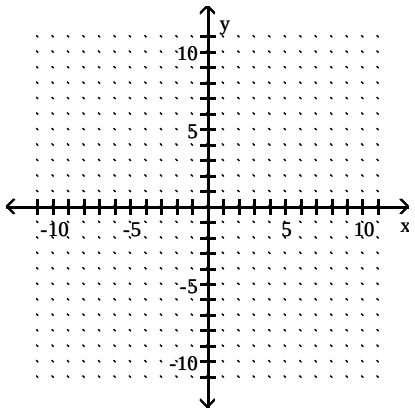
47) $x^2 + y^2 - 2x + 2y - 2 = 0$ 47) _____



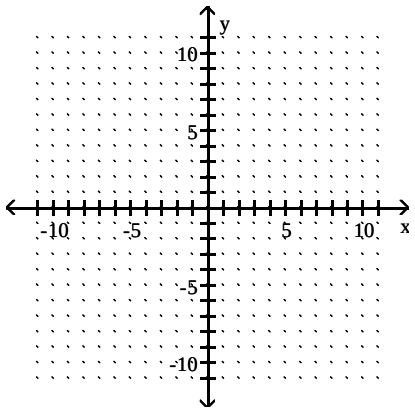
48) $x^2 + y^2 - 12x + 12y + 68 = 0$ 48) _____



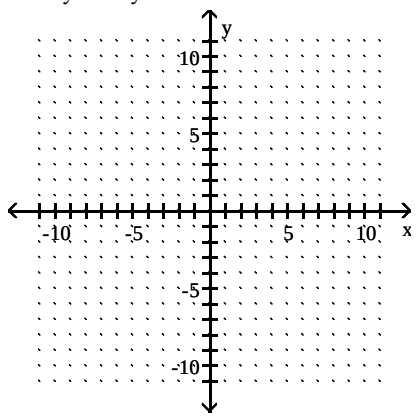
49) $x^2 + y^2 + 10x - 8y + 37 = 0$ 49) _____



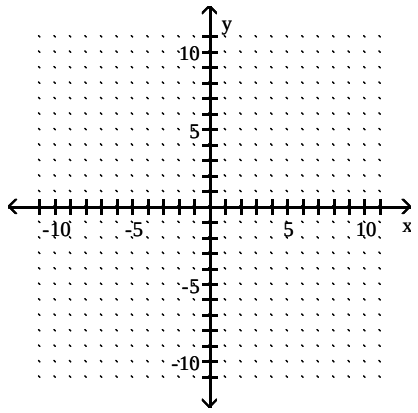
50) $x^2 + y^2 + 6x - 8y + 16 = 0$ 50) _____



51) $x^2 + y^2 + 4y - 12 = 0$ 51) _____



52) $x^2 + y^2 + 12y + 35 = 0$ 52) _____



Solve the problem.

53) 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? 53) _____

54) If a circle of radius 2 is made to roll along the x–axis, what is the equation for the path of the center of the circle? 54) _____

55) Earth is represented on a map of the solar system so that its surface is a circle with the equation $x^2 + y^2 + 8x + 6y - 3696 = 0$. A weather satellite circles 0.7 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. 55) _____

56) Earth is represented on a map of the solar system so that its surface is a circle with the equation $x^2 + y^2 + 10x + 2y - 3818 = 0$. A weather satellite circles 0.8 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. 56) _____

57) Find an equation of the line containing the centers of the two circles 57) _____

$x^2 + y^2 - 4x + 10y + 28 = 0$ and

$x^2 + y^2 - 10x + 6y + 30 = 0$

58) Find an equation of the line containing the centers of the two circles 58) _____

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

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

Determine whether the equation represents direct, inverse, joint, or combined variation.

59) $y = \frac{3}{x}$ 59) _____

60) $y = \frac{8}{x}$ 60) _____

61) $y = 5x^2$ 61) _____

62) $y = 7x^4$ 62) _____

63) $y = 7x^4z^4$ 63) _____

64) $y = \frac{4x}{st}$ 64) _____

Solve the problem.

65) If m varies directly as p, and m = 27 when p = 3, find m when p is 6. 65) _____

66) If m varies directly as p, and m = 28 when p = 7, find m when p is 3. 66) _____

67) If x varies inversely as v, and x = 24 when v = 8, find x when v = 64. 67) _____

68) If x varies inversely as v, and x = 16 when v = 2, find x when v = 4. 68) _____

69) If f varies jointly as q^2 and h, and f = 16 when q = 2 and h = 2, find f when q = 3 and h = 4. 69) _____

70) If f varies jointly as q^2 and h, and f = 24 when q = 2 and h = 2, find f when q = 4 and h = 6. 70) _____

71) If f varies jointly as q^2 and h, and f = 64 when q = 4 and h = 2, find h when f = 150 and q = 5. 71) _____

Write an equation that expresses the relationship. Use k as the constant of variation.

72) r varies directly as t. 72) _____

73) s varies directly as t. 73) _____

74) d varies directly as y. 74) _____

Use the four–step procedure to solve the variation problem.

75) While traveling at a constant speed in a car, the centrifugal acceleration passengers feel while the car is turning varies inversely as the radius of the turn. If the passengers feel an acceleration of 16 feet per second per second when the radius of the turn is 60 feet, find the acceleration the passengers feel when the radius of the turn is 240 feet. 75) _____

76) While traveling at a constant speed in a car, the centrifugal acceleration passengers feel while the car is turning varies inversely as the radius of the turn. If the passengers feel an acceleration of 4 feet per second per second when the radius of the turn is 80 feet, find the acceleration the passengers feel when the radius of the turn is 160 feet. 76) _____

77) While traveling at a constant speed in a car, the centrifugal acceleration passengers feel while the car is turning varies inversely as the radius of the turn. If the passengers feel an acceleration of 6 feet per second per second when the radius of the turn is 70 feet, find the acceleration the passengers feel when the radius of the turn is 210 feet. 77) _____

1) $-\frac{1}{3}$

2) $-\frac{9}{8}$

3) undefined
4) undefined
5) 0
6) 0
7) 0

8) $\frac{7}{19}$

9) 41%
10) neither
11) neither
12) perpendicular
13) perpendicular
14) neither
15) neither
16) perpendicular
17) perpendicular
18) parallel
19) parallel
20) neither
21) $y = 6$
22) $y = 10$

23) $y = \frac{7}{8}x + \frac{3}{8}$

24) $y = \frac{5}{6}x + \frac{1}{3}$

25) $y = -\frac{2}{5}x + \frac{19}{5}$

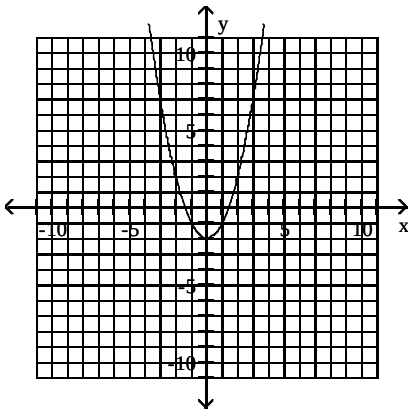
26) $y = -\frac{3}{8}x + \frac{39}{8}$

27) $y = 7$

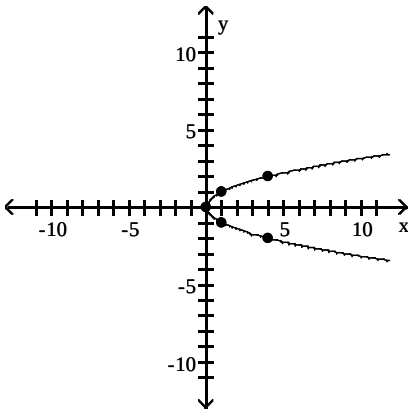
28) $y = \frac{2}{3}x - \frac{4}{3}$

29) $y = -1980x + 15{,}660$
30) $y = 3x + 2$
31) $y = -48x + 158$
32) $18.25

33)



34)



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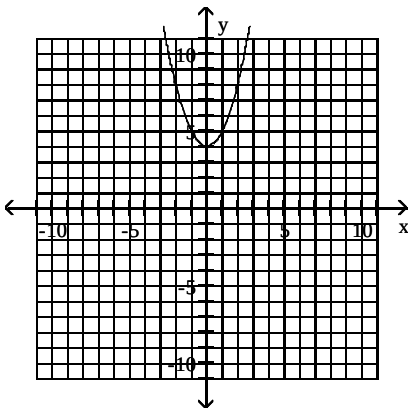

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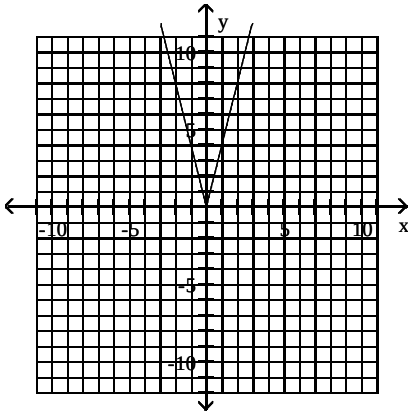

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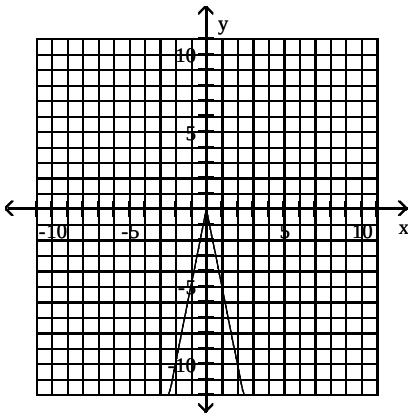
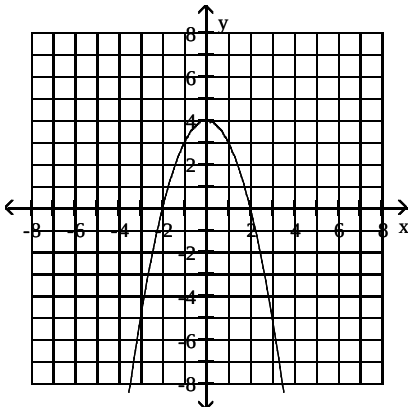
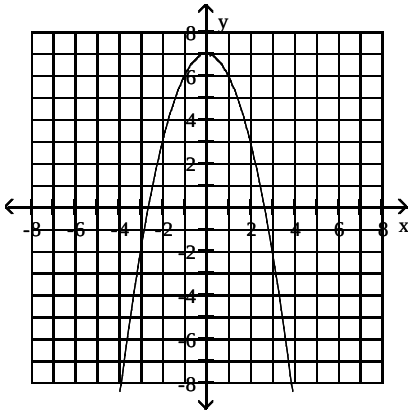


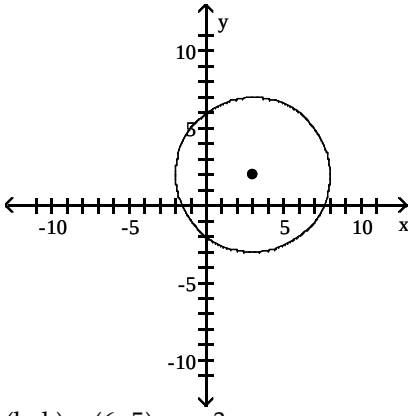
38) $y = 4 - x^2$



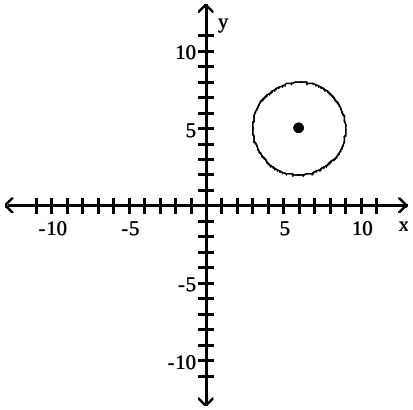
39) $y = 7 - x^2$



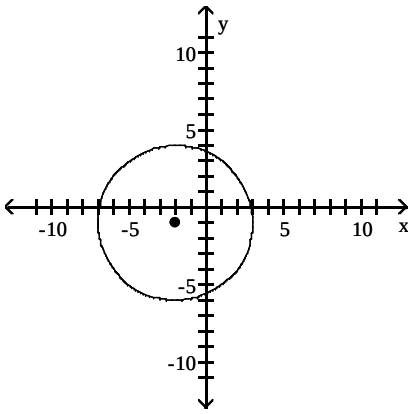
40) (h, k) = (3, 2); r = 5



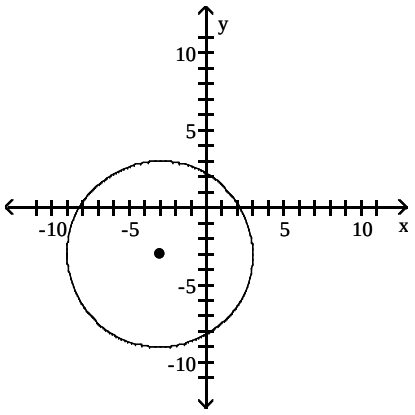
41) (h, k) = (6, 5); r = 3



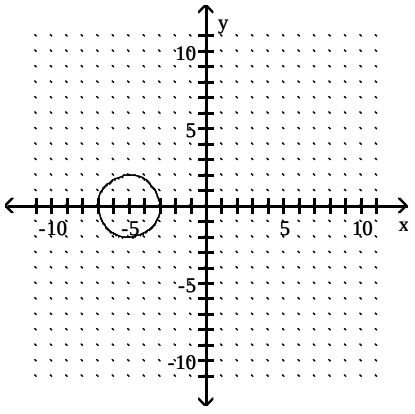
42) (h, k) = (-2, -1); r = 5



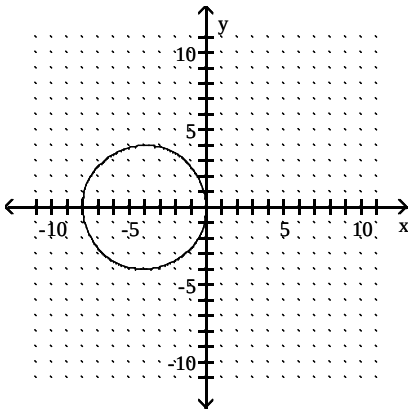
43) (h, k) = (-3, -3); r = 6



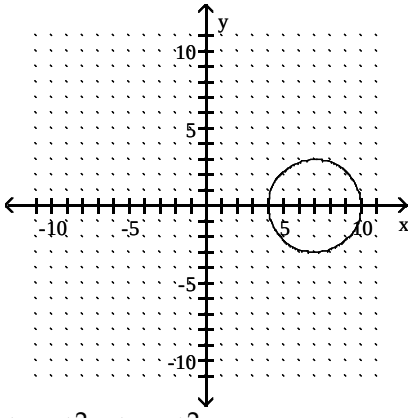
44) $(x + 5)^2 + y^2 = 4$
center (– 5, 0), r = 2



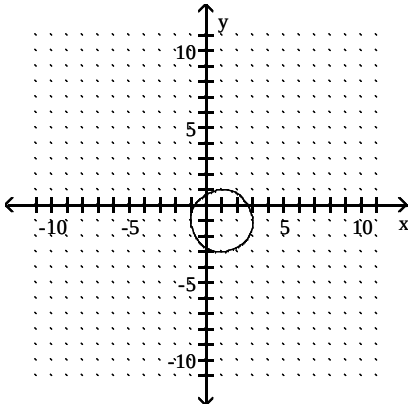
45) $(x + 4)^2 + y^2 = 16$
center $(-4, 0)$, $r = 4$



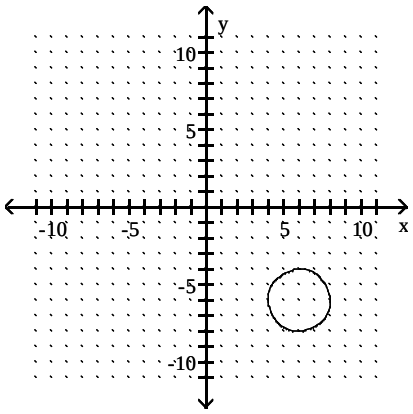
46) $(x - 7)^2 + y^2 = 9$
center $(7, 0)$, $r = 3$



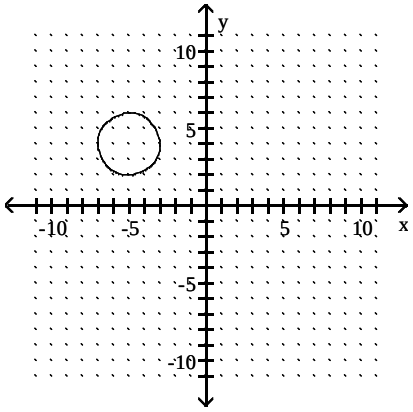
47) $(x - 1)^2 + (y + 1)^2 = 4$
center $(1, -1)$, $r = 2$



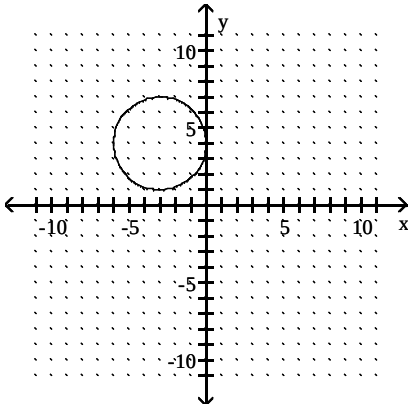
48) $(x - 6)^2 + (y + 6)^2 = 4$
center $(6, -6)$, $r = 2$



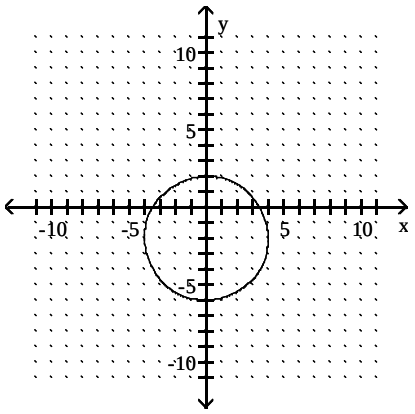
49) $(x + 5)^2 + (y - 4)^2 = 4$
center $(-5, 4)$, $r = 2$



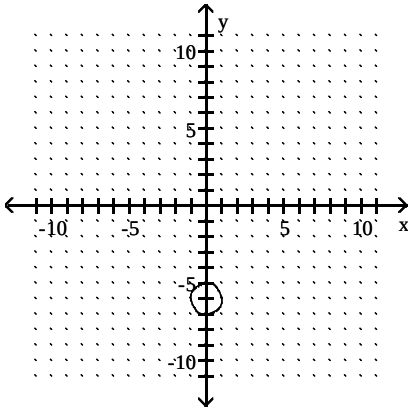
50) $(x + 3)^2 + (y - 4)^2 = 9$
center $(-3, 4)$, $r = 3$



51) $x^2 + (y + 2)^2 = 16$
center (0, – 2), r = 4



52) $x^2 + (y + 6)^2 = 1$
center (0, – 6), r = 1



53) y = 3
54) y = 2
55) $x^2 + y^2 + 8x + 6y - 3781.89 = 0$
56) $x^2 + y^2 + 10x + 2y - 3917.84 = 0$
57) -2x + 3y + 19 = 0
58) -2x + 3y + 11 = 0
59) Inverse
60) Inverse
61) Direct
62) Direct
63) Joint
64) Combined
65) 54
66) 12
67) 3
68) 8
69) 72
70) 288
71) 3
72) r = kt
73) s = kt
74) d = ky

75) 4 feet per second per second
76) 2 feet per second per second
77) 2 feet per second per second