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

Write the standard equation for the circle.

1) Center at $\left(-\dfrac{4}{5}, -\dfrac{3}{2}\right)$, radius $\dfrac{3}{5}$

1) _____

A) $\left(x - \dfrac{3}{2}\right)^2 + \left(y - \dfrac{4}{5}\right)^2 = \dfrac{3}{5}$

B) $\left(x + \dfrac{4}{5}\right)^2 + \left(y + \dfrac{3}{2}\right)^2 = \dfrac{9}{25}$

C) $\left(x + \dfrac{3}{2}\right)^2 + \left(y + \dfrac{4}{5}\right)^2 = \dfrac{3}{5}$

D) $\left(x - \dfrac{4}{5}\right)^2 + \left(y - \dfrac{3}{2}\right)^2 = \dfrac{9}{25}$

**Solve the problem.**

2) The graph shows an idealized linear relationship for the average monthly payments to retirees from 1995 through 1999. Find the midpoint of the line segment to estimate the payment for 1997.

2) _____

Average Monthly Payments to Retiree
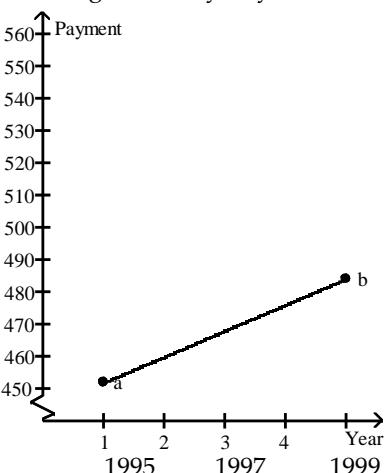
a = \$452; b = \$484

A) 468 dollars   B) 484 dollars   C) 500 dollars   D) 16 dollars

3) The cost, T, in hundreds of dollars, of tuition at one community college is given by $T = 3 + \dfrac{7}{5}c$, where c is the number of credits for which a student registers. Estimate the cost of tuition if a student registers for 13 credits.

3) _____

A) About \$3000   B) About \$2100   C) About \$2600   D) About \$1800

4) Jim had grades of 78 and 100 on two chemistry tests. What is the lowest score he can get on the third test to maintain an average of 85?

4) _____

A) 77   B) 88   C) 85   D) 89

5) Decide whether or not the points are the vertices of a right triangle.   5) _____
   (1, 1), (7, 3), (11, −9)

    A) No   B) Yes

6) Your company uses the quadratic model $y = -4.5x^2 + 150x$ to represent the average number of   6) _____
   new customers who will be signed on (x) weeks after the release of your new service. How many
   new customers can you expect to gain in week 8?

    A) 912 customers   B) 456 customers   C) 312 customers   D) 1164 customers

Solve the equation.

7) $-6a + 3 + 7a = 10 - 20$ 7) _____

    A) {-13}   B) {33}   C) {-33}   D) {13}

Find the center and radius of the circle.

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

    A) Center: (−6, 8); radius: 16   B) Center: (8, −6); radius: 16

    C) Center: (−6, 8); radius: 4   D) Center: (8, −6); radius: 4

Use the method of your choice to find all real solutions of the equation.

9) $\frac{4}{9}x^2 - \frac{4}{3}x = -1$ 9) _____

    A) $\frac{3 \pm 2\sqrt{2}}{2}$ B) $\frac{2}{3}$ C) $-\frac{3}{2}$ D) $\frac{3}{2}$

Solve the equation. Identify the equation as an identity, an inconsistent equation, or a conditional equation.

10) $3(2f + 48) = 6f + 144$ 10) _____

    A) Inconsistent, ∅   B) Conditional, {all real numbers}

    C) Identity, {all real numbers}   D) Conditional, {1}

Find the equation of the line through the given pair of points in standard form using only integers.

11) (4, −3) and (4, 4)   11) _____

    A) y = 4   B) x = −3   C) x = 4   D) y = −3

Write the standard equation for the circle.

12) Center (19, 12), passing through (0, 12)   12) _____

    A) $(x - 19)^2 + (y - 12)^2 = 361$ B) $(x - 12)^2 + (y - 19)^2 = 361$

    C) $(x - 12)^2 + (y - 19)^2 = 19$ D) $(x - 19)^2 + (y - 12)^2 = 19$

Determine whether or not the function is one−to−one.

13) $f(x) = -\sqrt[3]{x + 86}$ 13) _____

    A) Yes   B) No

Solve the problem.

14) A balloon (in the shape of a sphere) is being inflated. The radius is increasing at a rate of 10 cm per second. Find a function, r(t), for the radius in terms of t. Find a function, V(r), for the volume of the balloon in terms of r. Find (V ∘ r)(t).

    A) $(V \circ r)(t) = \dfrac{5000\pi t^2}{3}$ B) $(V \circ r)(t) = \dfrac{40000\pi \sqrt{t}}{3}$

    C) $(V \circ r)(t) = \dfrac{4000\pi t^3}{3}$ D) $(V \circ r)(t) = \dfrac{700\pi t^3}{3}$

14) _____

Write the equation of the graph after the indicated transformation(s).

15) The graph of $y = \sqrt[3]{x}$ is shifted 2.6 units to the left. This graph is then vertically stretched by a factor of 2.2. Finally, the graph is reflected across the x-axis.

    A) $f(x) = -2.2\sqrt[3]{x + 2.6}$ B) $f(x) = -2.2\sqrt[3]{x - 2.6}$

    C) $f(x) = 2.2\sqrt[3]{x + 2.6}$ D) $f(x) = -2.6\sqrt[3]{x + 2.2}$

15) _____

Solve the problem.

16) Assume it costs 25 cents to mail a letter weighing one ounce or less, and then 20 cents for each additional ounce or fraction of an ounce. Let L(x) be the cost of mailing a letter weighing x ounces. Graph y = L(x).

16) _____

    A)

    B)
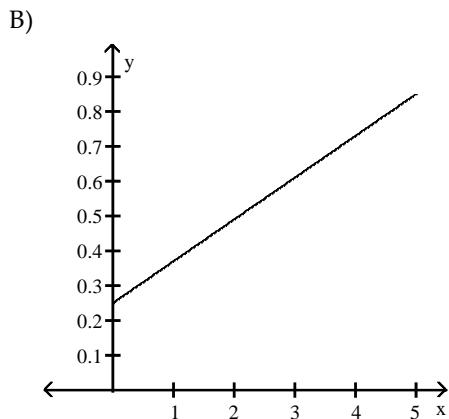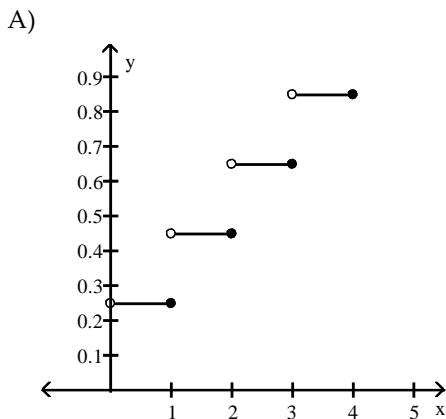
Evaluate.

17) If $f(x) = (x + 8)^2$, find f(7).

    A) 30   B) 1   C) -225   D) 225

17) _____

Graph the equation by plotting ordered pairs of numbers.

18) $y = \dfrac{1}{5}(x + 2)^2 + 5$

18) _____

A)

B)

C)

D)
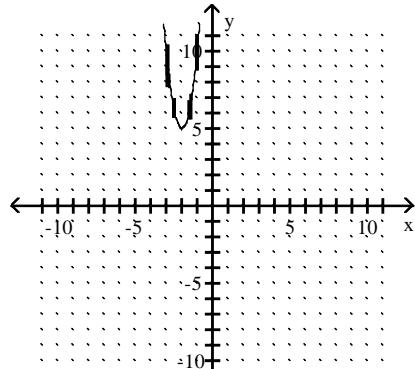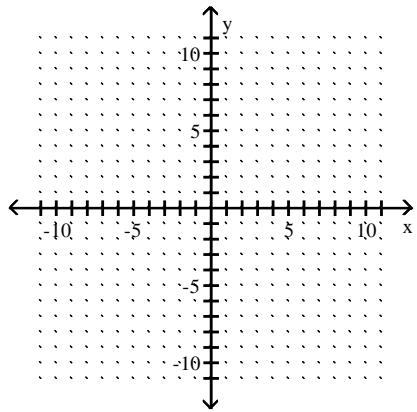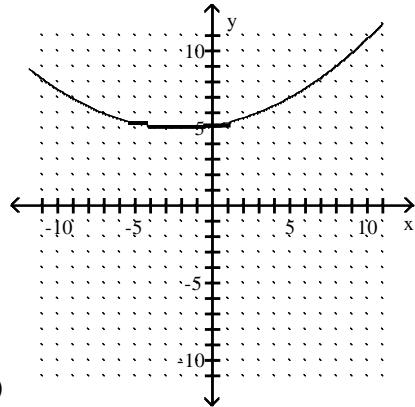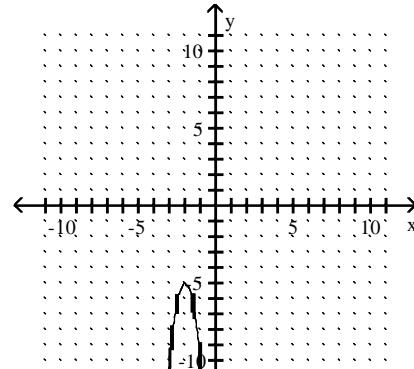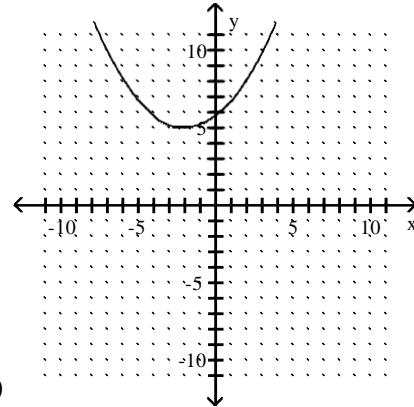
Solve the problem.

19) Employees of a publishing company received an increase in salary of 3% plus a bonus of $1100. Let S(x) represent the new salary in terms of the previous salary x. Find the value of S(15,000).

19) _____

A) $20,600　　　　B) $16,100　　　　C) $16,550　　　　D) $13,495

Solve the inequality by reading the given graph. State the solution set using interval notation.

20) $-x^3 + 2x^2 + 25x - 50 < 0$ A related function is graphed below.

20) _____
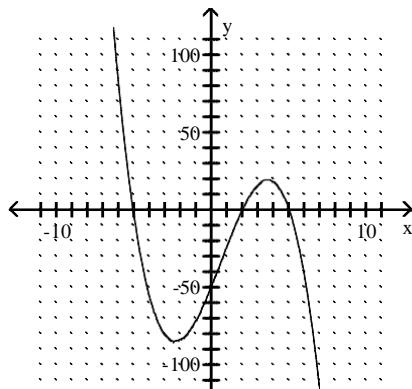
x-intercepts: (-5, 0), (2, 0), (5, 0)

  A) (-5, 2) ∪ (5, ∞)   B) (-∞, -5) ∪ (2, 5)   C) [-5, 2] ∪ [5, ∞)   D) (5, ∞)

Use the vertical line test to determine whether y is a function of x.

21)

21) _____
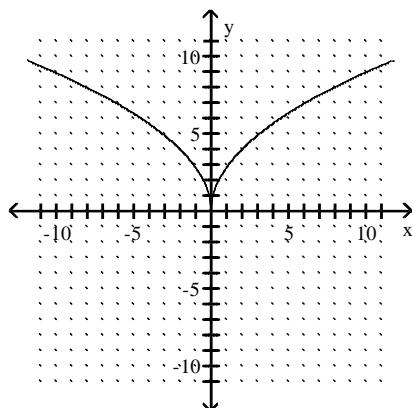
  A) Yes   B) No

Graph the function.

22)

22) _____

$$f(x) = \begin{cases} 4 & \text{for } x \geq 1 \\ -5 - x & \text{for } x < 1 \end{cases}$$

5

A)

B)

C)

D)
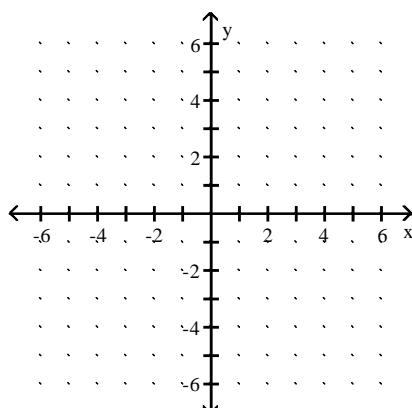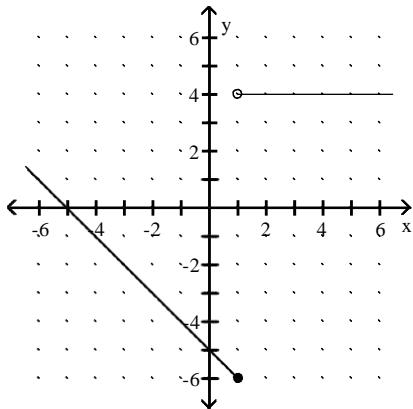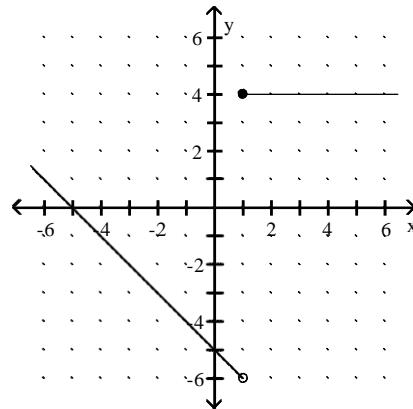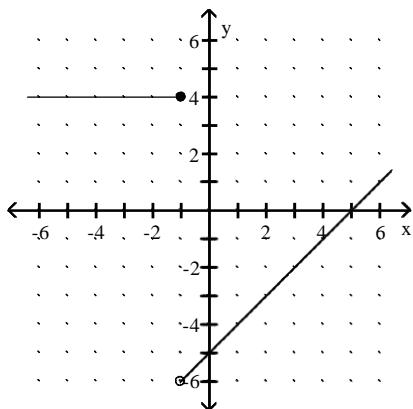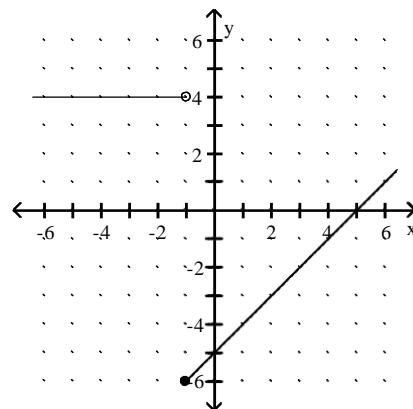
Solve the problem.

23) The weight of a liquid varies directly as its volume V. If the weight of the liquid in a cubical   23) _____
    container 5 cm on a side is 375 g, find the weight of the liquid in a cubical container 3 cm on a side.

   A) 81 g   B) 12 g   C) 27 g   D) 9 g

Use the rational zero theorem to find all possible rational zeros for the polynomial function.

24) $P(x) = 2x^3 + 5x^2 + 14x - 8$ 24) _____

   A) ±1, ±2, ±4, ±8   B) ±1, ±2, ±4

   C) ±1, $\pm \dfrac{1}{2}$, ±2, ±4, ±8   D) ±1, $\pm \dfrac{1}{2}$, $\pm \dfrac{1}{4}$, $\pm \dfrac{1}{8}$, ±2

Determine whether the given number is a zero of the polynomial function.

25) $P(x) = -8x^3 + x^2 + 6x - 7;\ -2$ 25) _____

   A) No   B) Yes

Use the theorem on bounds to establish the best integral bounds for the roots of the equation.

26) $3x^4 - 8x^3 - 8x - 9 = 0$ 26) _____

   A) –2 < x < 2   B) –1 < x < 1   C) –1 < x < 4   D) –2 < x < 1

For the given function, find all asymptotes of the type indicated (if there are any).

27) $f(x) = \dfrac{x^2 + 8x + 9}{x + 2}$, oblique

27) _____

    A) y = x – 10   B) x = y + 6   C) None   D) y = x + 6

Use ordinary division of polynomials to find the quotient and remainder when the first polynomial is divided by the second.

28) $x^4 + 4x^3 - 3x^2 + 4x + -4$, $x^2 + 1$

28) _____

    A) $x^2 + 4x - 4$ B) $x^2 - 4x - 4$; $-4x - 4$

    C) $x^2 + 4x - 4$; $-4x - 4$ D) $x^2 - 4x - 4$

Solve the problem.

29) The polynomial $G(x) = -0.006x^4 + 0.140x^3 - 0.53x^2 + 1.79x$ measures the concentration of a dye in the bloodstream x seconds after it is injected. Does the concentration increase between 9 and 10 seconds?

29) _____

    A) No   B) Yes

Sketch the graph of the rational function. Note that the function is not in lowest terms.

30) $f(x) = \dfrac{x - 3}{x^2 - 5x + 6}$

30) _____

    A) x ≠ –3, 6

7
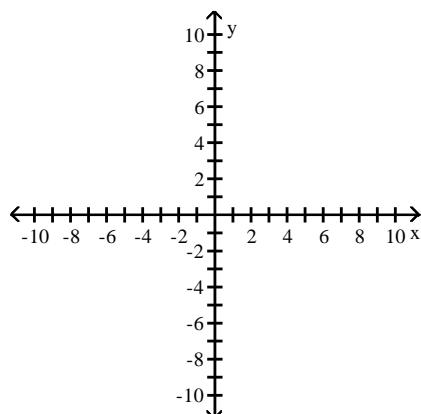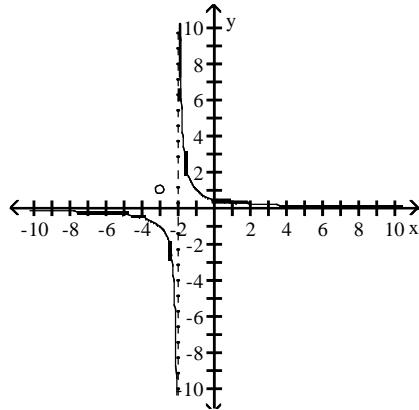
B) x ≠ 2, 3
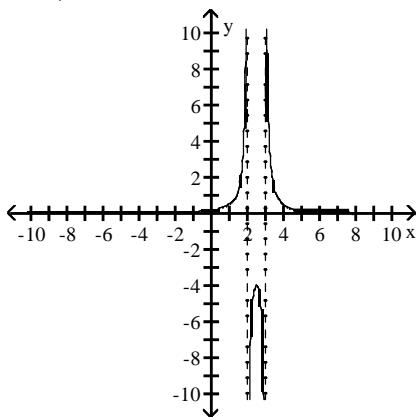
C) x ≠ 2, 3
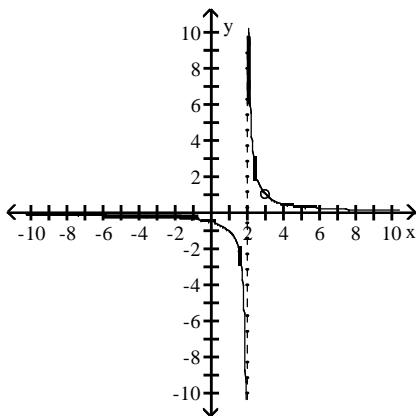
D) x ≠ -3, 6
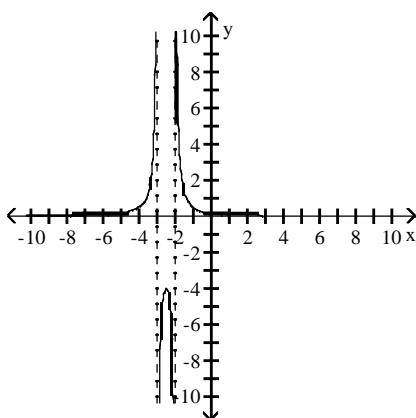
Find a polynomial equation with real coefficients that has the given roots.

31) 1, -8   31) _____

A) $x^2 - 8x + 7 = 0$ B) $x^2 - 8x - 7 = 0$ C) $x^2 - 7x - 8 = 0$ D) $x^2 + 7x - 8 = 0$

8

Explain the behavior of the graph of f(x) as it approaches its vertical asymptote.

32) $f(x) = \dfrac{(-1)^2}{(x-2)^2}$

32) _____

    A) Approaches ∞ from the left and the right

    B) Approaches -∞ from the left, approaches ∞ from the right

    C) Approaches ∞ from the left, approaches -∞ from the right

    D) Approaches -∞ from the left and the right

Solve the equation. If necessary, round to thousandths.

33) $\left(\dfrac{1}{3}\right)^x = 17$

33) _____

    A) 2.579   B) -5.667   C) -0.388   D) -2.579

Solve the equation.

34) $729^x = 9$

34) _____

    A) -3   B) $-\dfrac{1}{3}$ C) $\dfrac{1}{3}$ D) 3

**Graph the function.**

35) $y = -0.3 \cdot 3^x + 4$

35) _____
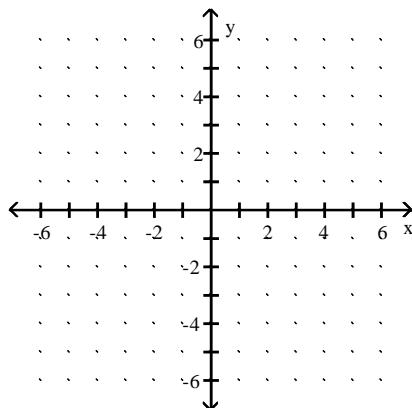
A)
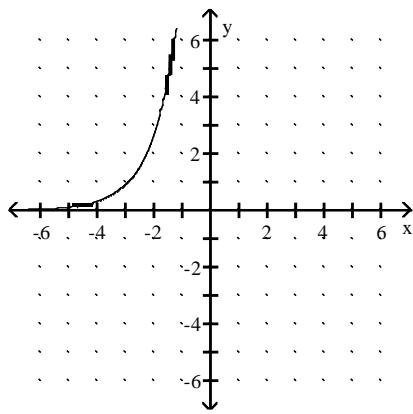
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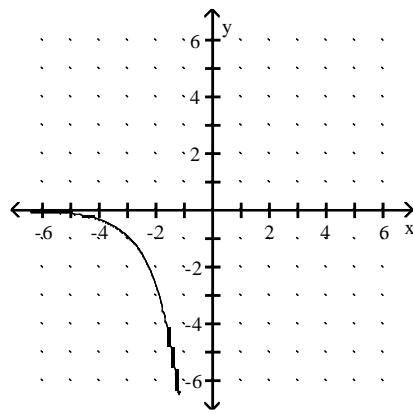
C)
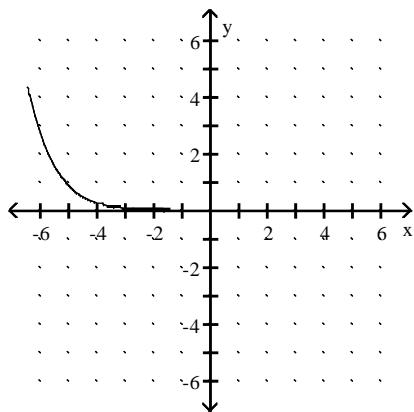
D)
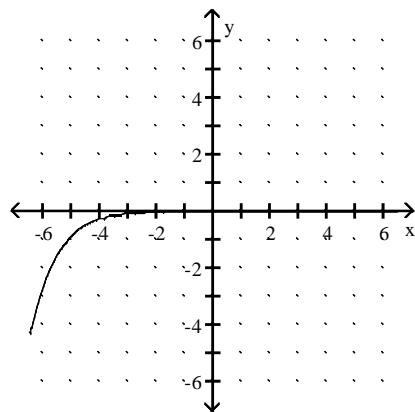
Solve the equation. Round to four decimal places.

36) $100(1.08)^x = 250(1.05)^{2x}$

36) _____

A) −7.0995   B) −44.4385   C) −5.2497   D) 0.0206

Graph the function.

37) $f(x) = 3^{(3x - 2)}$

37) _____


A)

B)

10

C)

D)
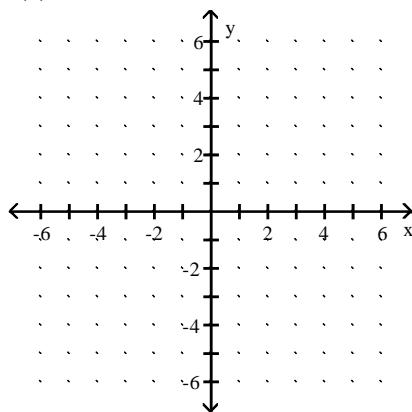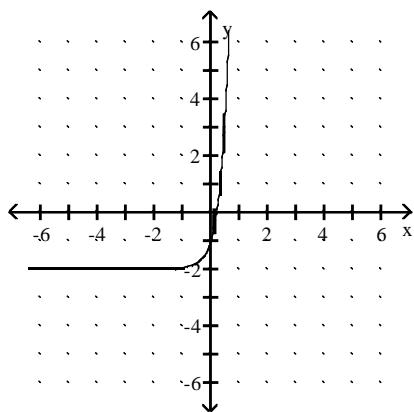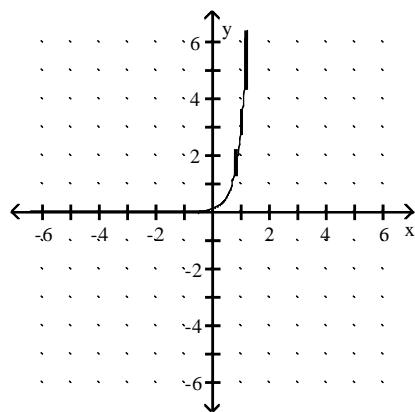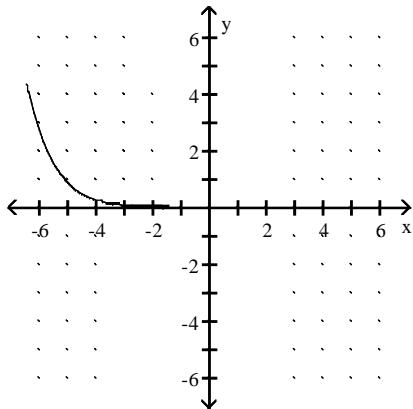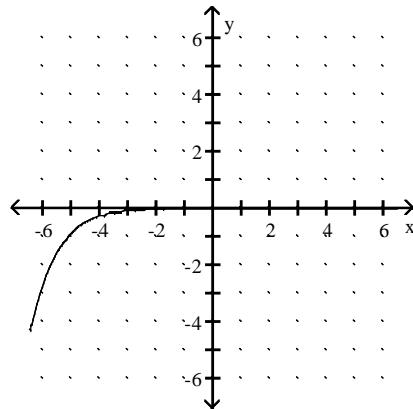
Solve the problem.

38) At what interest rate would a deposit of $45,000 grow to $110,682 in 30 years with continuous compounding?

    A) 6%   B) 1%   C) 3%   D) 4%

38) _____

Solve the equation.

39) $\log_3 \sqrt{32} = x$

    A) $\sqrt{2}$ B) 1   C) 6   D) 2

39) _____

Solve the equation. Round your answer to three decimal places.

40) $\left(\dfrac{1}{3}\right)^x = 18$

    A) −6.000   B) −0.380   C) −2.631   D) 2.631

40) _____

Graph the solution set of the system.

41) $2x + y \geq 4$
    $x - 1 \geq 0$

41) _____
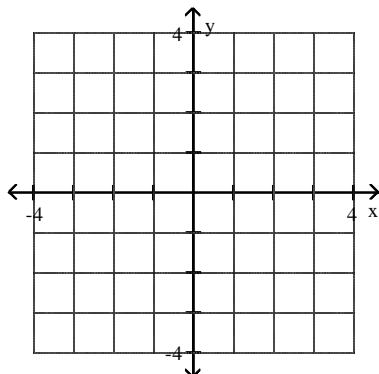
A)
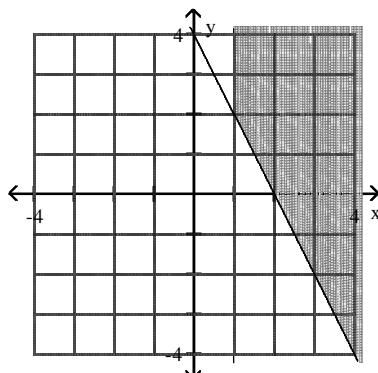
B)
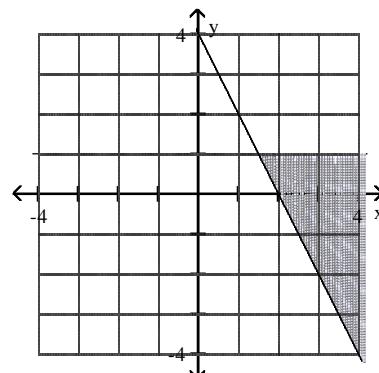
C)
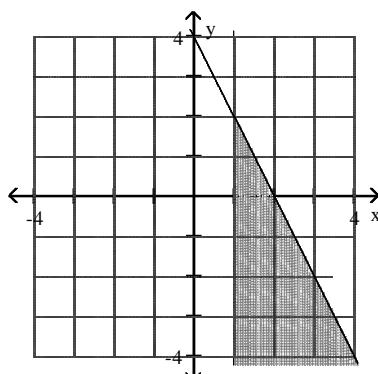
D)
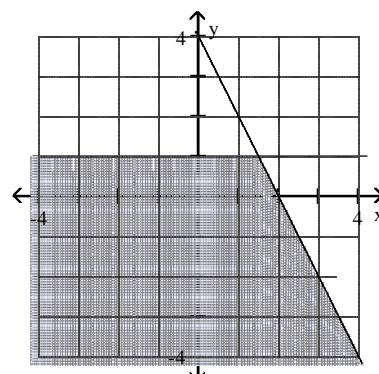
Classify the system as independent, inconsistent, or dependent.

42) $x - 3y = 6$
    $3y + 1 = x$

42) _____

    A) Dependent   B) Inconsistent   C) Independent

Solve the system.

43) $x^2 - y^2 = 39$
    $x - y = 3$

43) _____

    A) $\{(-8, 5)\}$ B) $\{(-8, -5)\}$ C) $\{(8, -5)\}$ D) $\{(8, 5)\}$

Solve the system by substitution.

44) $x + 8y = 0$
    $x - 8y = 32$

    A) $\{(8, -1)\}$ B) $\{(16, 2)\}$ C) $\{(-2, 16)\}$ D) $\{(16, -2)\}$

44) _____

45) $0.9x + 0.2y = 3$
    $x - 0.8y = 6.4$

    A) $\{(4, -3)\}$ B) $\{(0.4, -0.3)\}$ C) $\varnothing$ D) $\{(-3, 4)\}$

45) _____

Classify the system as independent, inconsistent, or dependent.

46) $x + y = 2$
    $x + y = 5$

    A) Inconsistent   B) Independent   C) Dependent

46) _____

Graph the system of inequalities. Indicate the solution set by shading.

47) $y \geq (x + 3)^3$
 $y \geq (x + 3)^2 - 4$
    $y + x \leq 2$

47) _____

A)

B)

13
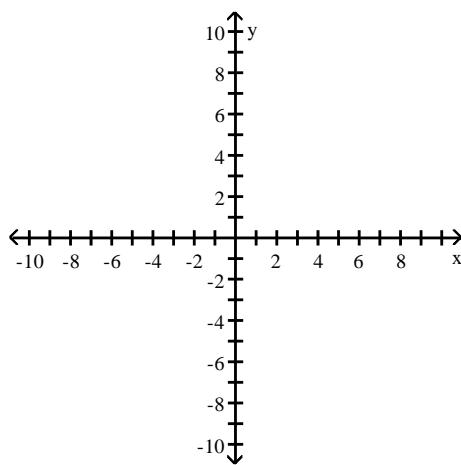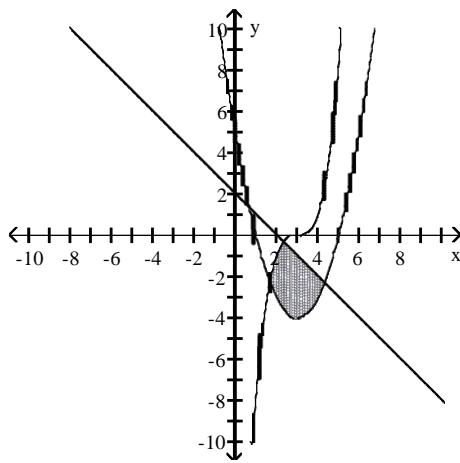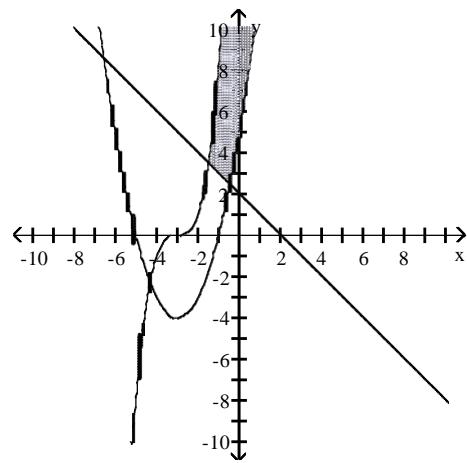
C)
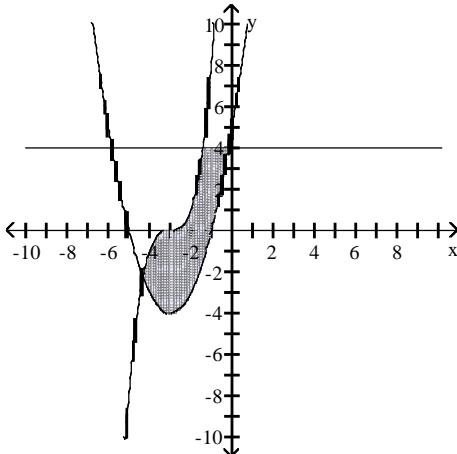
D)
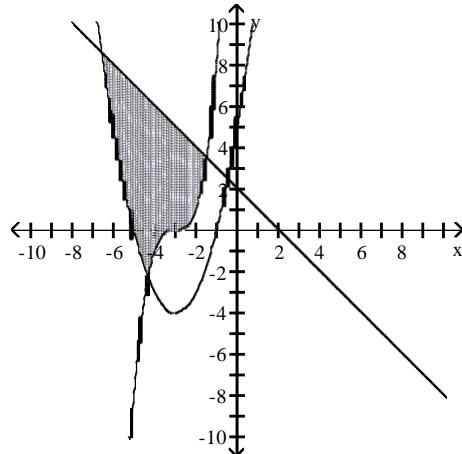
Use a graphing calculator to solve the system by finding A^{-1} and $A^{-1}B$. (Round to the nearest integer if necessary.)

48)
$$-0.107x + 1.300y - 0.417z = 10.55$$
$$1.976y - 1.102z = 15.58$$
$$-0.205x \qquad - 1.544z = -3.70$$

48) _____

    A) {(3, –9, –2)}   B) {(3, 9, 2)}   C) {(4, 7, 2)}   D) {(9, 2, 9)}

Find the product.

49) $\begin{bmatrix} 2 & 3 \\ 3 & 6 \end{bmatrix} \begin{bmatrix} 2 & -1 \\ -1 & \dfrac{2}{3} \end{bmatrix}$

49) _____

A) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ D) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$

Solve the problem.

50) A company makes 3 types of cable. Cable A requires 3 black, 3 white, and 2 red wires. B requires 1 black, 2 white, and 1 red. C requires 2 black, 1 white, and 2 red. They used 95 black, 100 white and 80 red wires. How many of each cable were made?

50) _____

A) 15 cable A   B) 48 cable A   C) 15 cable A   D) 20 cable A
    16 cable B   20 cable B   20 cable B   15 cable B
    15 cable C   12 cable C   15 cable C   15 cable C

Perform the indicated operation, if possible.

51) $\begin{bmatrix} -9x - 2y \\ 5k - 9z \\ -12w + 7v \\ -2m + 2n \end{bmatrix} - \begin{bmatrix} 5x + 5y \\ -10k + 3z \\ 5w - 3v \\ 8m + 8n \end{bmatrix}$

51) _____

A) $\begin{bmatrix} -14x + 3y \\ 15k - 6z \\ -17w + 4v \\ -10m + 10n \end{bmatrix}$ B) $\begin{bmatrix} -4x - 7y \\ -5k - 12z \\ -7w + 10v \\ 6m - 6n \end{bmatrix}$ C) $\begin{bmatrix} -14x - 7y \\ 15k - 12z \\ -17w + 10v \\ -10m - 6n \end{bmatrix}$ D) $\begin{bmatrix} -4x + 3y \\ -5k - 6z \\ -7w + 4v \\ 6m + 10n \end{bmatrix}$

14

Determine the size of the matrix.

52) $\begin{bmatrix} 2 & 0 & 4 \\ -3 & 6 & -6 \\ 0 & 8 & -4 \end{bmatrix}$

52) _____

    A) 3 × 3   B) 6 × 6   C) 9   D) 2 × 3

Solve the problem.

53) Sara works at a fast food restaurant. On one day she sold 79 double hamburgers, 88 fish sandwiches, 51 orders of French fries, 48 small drinks, 42 medium drinks, and 94 large drinks. On the next day she sold 30 double hamburgers, 68 fish sandwiches, 49 orders of French fries, 28 small drinks, 75 medium drinks, and 14 large drinks. Write this information in a 2x6 matrix.

53) _____

A)
$\begin{bmatrix} 79 & 88 & 51 & 48 & 42 & 94 \\ 30 & 68 & 49 & 28 & 75 & 14 \end{bmatrix}$

B)
$\begin{bmatrix} 79 & 30 \\ 88 & 68 \\ 51 & 49 \\ 48 & 28 \\ 42 & 75 \\ 94 & 14 \end{bmatrix}$

C)
$\begin{bmatrix} 79 & 14 \\ 88 & 75 \\ 51 & 28 \\ 48 & 49 \\ 42 & 68 \\ 94 & 30 \end{bmatrix}$

D)
$\begin{bmatrix} 79 & 88 & 51 & 48 & 42 & 94 \\ 14 & 75 & 28 & 49 & 68 & 30 \end{bmatrix}$

Graph the hyperbola.

54) $25x^2 - 4y^2 = 100$

54) _____
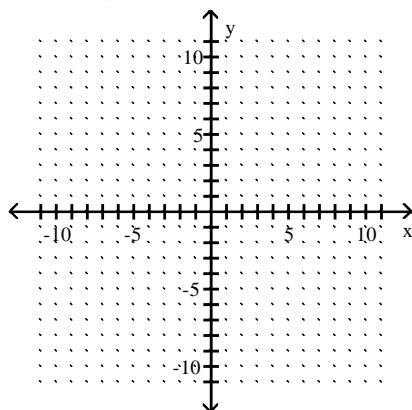
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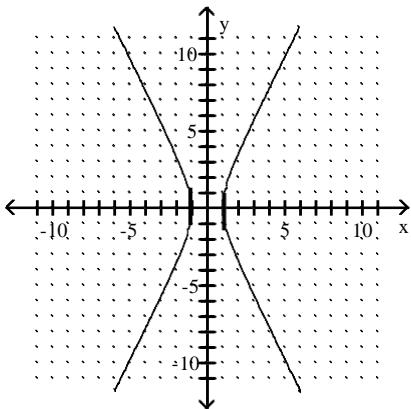
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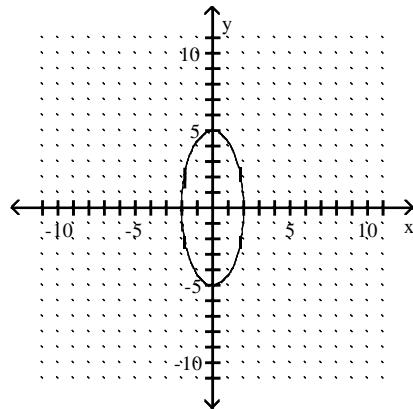
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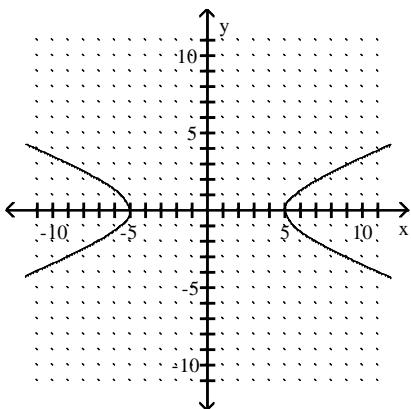
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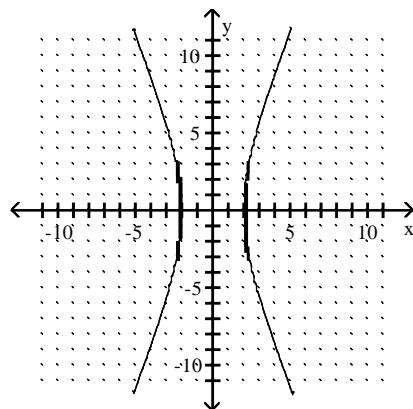
Solve.

55) The roof of a building is in the shape of the hyperbola $y^2 - x^2 = 42$, where x and y are in meters.   55) _____
Refer to the figure and determine the height h of the outside walls.

A = 5 m
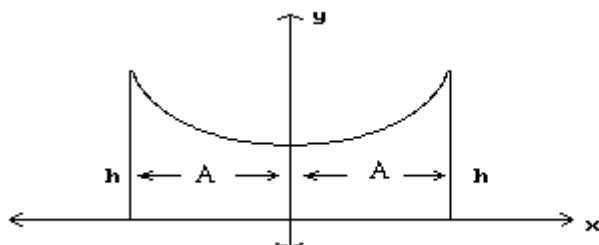
A) 8.2 m   B) 67 m   C) 37 m   D) –17 m

Identify the equation as a parabola, ellipse, or circle.

56) $y^2 = 36 - x^2$ 56) _____

A) Circle   B) Ellipse

C) Parabola   D) None of the above

16

Find the foci of the ellipse.

57) $9x^2 - 54x + 25y^2 + 100y - 44 = 0$

57) _____

    A) $(-1, -2), (7, -2)$ B) $(-2, 0), (-2, 6)$ C) $(-2, -1), (-2, 7)$ D) $(0, -2), (6, -2)$

Identify the equation as a parabola, ellipse, or circle.

58) $4x^2 = 36 - 4y^2$

58) _____

    A) Ellipse   B) Circle

    C) Parabola   D) None of the above

Write a recursion formula for the sequence.

59) $-2, -8, -32, -128, \ldots$

59) _____

    A) $a_n = a_{n-1} + 8, a_1 = -2$ B) $a_n = 8a_{n-1}, a_1 = -2$

    C) $a_n = a_{n-1} + 4, a_1 = -2$ D) $a_n = 4a_{n-1}, a_1 = -2$

Find all the terms of the finite sequence.

60) $a_n = n^2 - n, 1 \le n \le 5$

60) _____

    A) 0, 2, 6, 12, 20   B) 1, 4, 9, 16, 25   C) 2, 6, 12, 20, 30   D) 0, 3, 8, 15, 24

Write a formula for the nth term of the arithmetic sequence. Do not use a recursion formula.

61) $9, 13, 17, 21, \ldots$

61) _____

    A) 9   B) 4   C) 3   D) Not arithmetic

Determine whether the statement is true for n = 1, 2, 3, 4, and 5. Use the number of true statements as your answer.

62) $2n < n^2$

62) _____

    A) 4   B) 3   C) 5   D) 2

Solve the problem.

63) How many 5-card poker hands consisting of 2 aces and 3 kings are possible with an ordinary 52-card deck?

63) _____

    A) 12   B) 24   C) 288   D) 6

Find the slope of the line containing the pair of points.

64) $(7, -5), (-6, 1)$

64) _____

    A) $-\dfrac{6}{13}$ B) $\dfrac{13}{6}$ C) $-\dfrac{13}{6}$ D) $\dfrac{6}{13}$

Solve the problem.

65) A triangular lake-front lot has a perimeter of 1900 feet. One side is 200 feet longer than the shortest side, while the third side is 500 feet longer than the shortest side. Find the lengths of all three sides.

65) _____

    A) 100 ft, 200 ft, 300 ft   B) 500 ft, 700 ft, 1000 ft

    C) 500 ft, 500 ft, 500 ft   D) 400 ft, 600 ft, 900 ft

Graph the equation in the rectangular coordinate system.

66) x = −1

66) _____

A)

B)

C)

D)
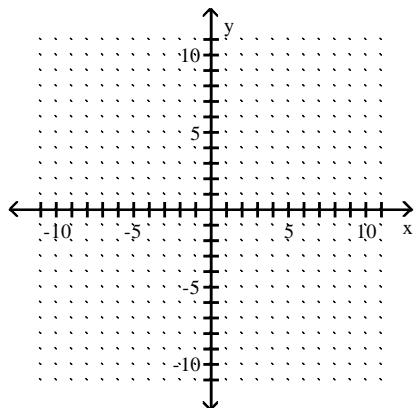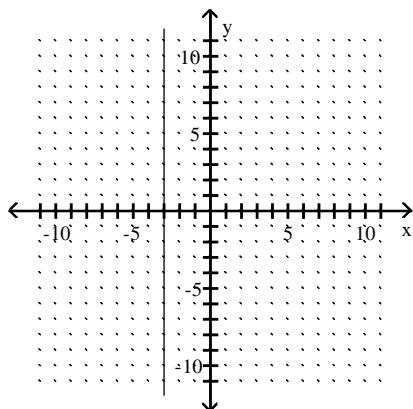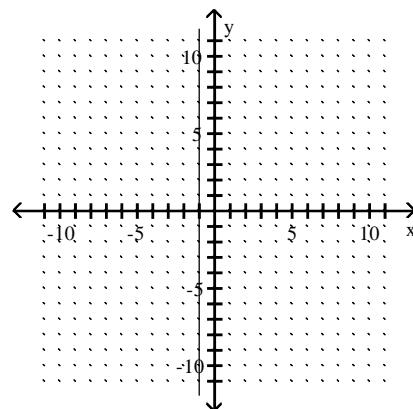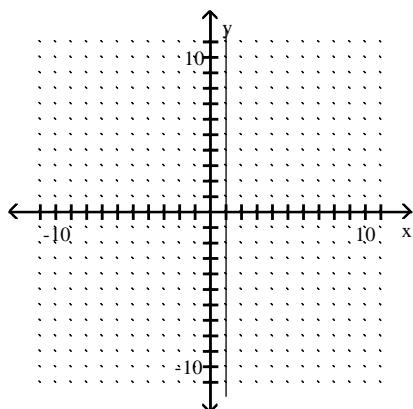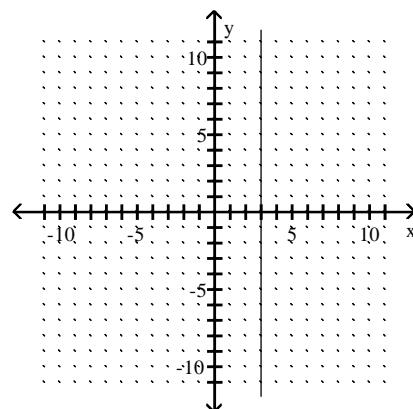
67) y = -1
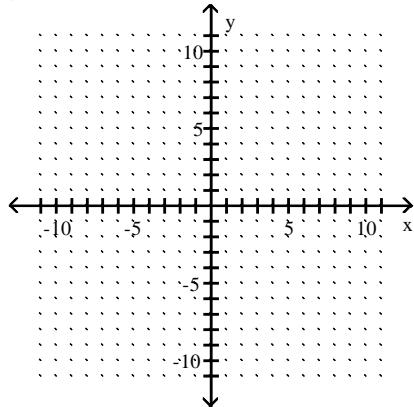
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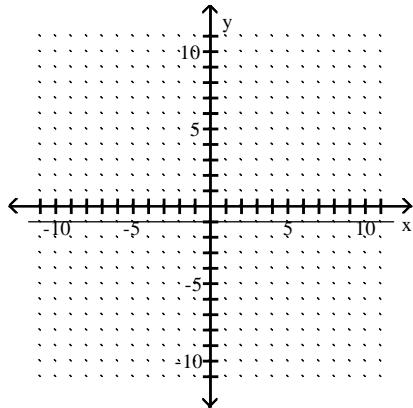
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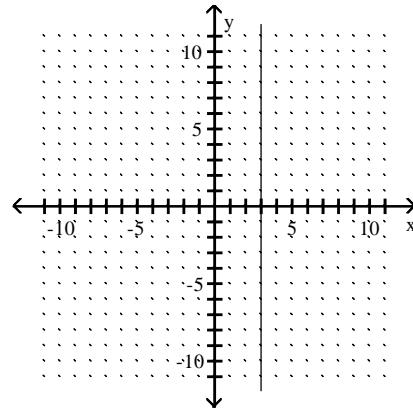
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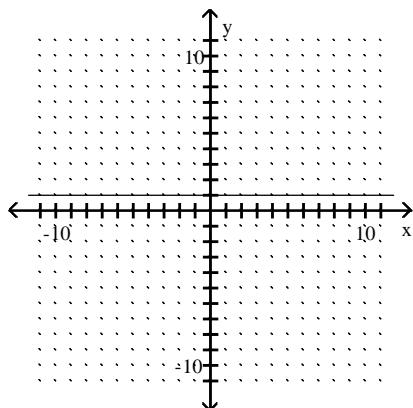
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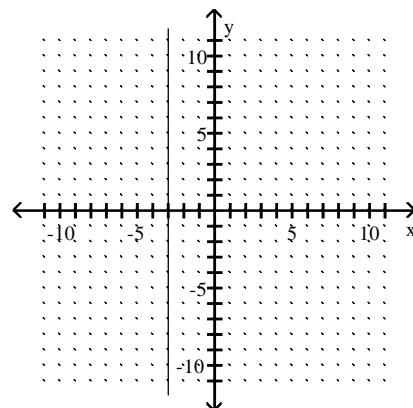
Write the equation of the graph after the indicated transformation(s).

68) The graph of $y = |x|$ is vertically stretched by a factor of 5.8. This graph is then reflected across the x-axis. Finally, the graph is shifted 0.32 units downward.

68) _____

A) $f(x) = 5.8|-x| - 0.32$

B) $f(x) = -5.8|x| - 0.32$

C) $f(x) = 5.8|x| - 0.32$

D) $f(x) = 5.8|x - 0.32|$

19

Write the formula expressed by the variation.

69) y varies inversely as x: y = 28, when x = 5

69) _____

A) $y = \dfrac{33}{x}$ B) $y = \dfrac{140}{x}$ C) $y = \dfrac{5.6}{x}$ D) $y = 5.6x$

Solve the problem.

70) If f varies jointly as q^2 and h, and f = -54 when q = 3 and h = 3, find f when q = 2 and h = 5.

70) _____

A) f = -40 B) f = -10 C) f = -20 D) f = -8

List the symmetries of the given function, if there are any. Otherwise, state "No symmetry".

71) $f(x) = |x + 8|$

71) _____

A) x = 8 B) x = -8, origin C) y-axis D) x = -8

Solve the problem.

72) In the following formula, y is the minimum number of hours of studying required to attain a test

score of x: $y = \dfrac{0.55x}{100.5 - x}$. How many hours of study are needed to score 82?

72) _____

A) 100.82 hr B) 4.23 hr C) 2.44 hr D) 24.40 hr

Use the factor theorem to decide whether or not the second polynomial is a factor of the first.

73) $4x^2 + 6x + 70; x - 5$

73) _____

A) No B) Yes

For the given function, find all asymptotes of the type indicated (if there are any).

74) $f(x) = \dfrac{x^2 + 7x - 9}{x - 9}$, oblique

74) _____

A) y = x - 2 B) y = x + 16 C) None D) x = y + 16

Solve the problem.

75) If $5000 is invested in an account that pays interest compounded continuously, how long will it take to grow to $10,000 at 4.25%?

75) _____

A) 14.1 years B) 2.9 years C) 16.3 years D) 12.8 years

76) In the formula $A = Ie^{kt}$, A is the amount of radioactive material remaining from an initial amount I at a given time t, and k is a negative constant determined by the nature of the material. An artifact is discovered at a certain site. If it has 65% of the carbon-14 it originally contained, what is the approximate age of the artifact? (carbon -14 decays at the rate of 0.0125% annually.) (Round to the nearest year.)

76) _____

A) 2800 yr B) 5200 yr C) 3446 yr D) 1497 yr

77) A certain noise measures 30 decibels. If the intensity is multiplied by 10, how many decibels will the new noise measure? $D = 10 \log_{10}(S/S_0)$.

77) _____

A) 40 decibels B) 30 decibels C) 300 decibels D) 31 decibels

20

78) The perimeter of a rectangle is 48 m. If the width were doubled and the length were increased by 19 m, the perimeter would be 100 m. What are the length and width of the rectangle?

      78) _____

A) width 7, length 17   B) width 7, length 12

C) width 12, length 12   D) width 17, length 7

Solve the system by addition.

79) $-6x + 9y = -36$
    $4x - 5y = 24$

      79) _____

A) $\{(6, 1)\}$ B) $\{(5, 1)\}$ C) $\varnothing$ D) $\{(6, 0)\}$

Use the determinant feature of a graphing calculator to solve the system by Cramer's rule . (Round to one decimal place.)

80) $1.6x + 0.6y + 4.0z = 3.7$
    $4.8x - 7.0y + 0.5z = -3.3$
    $4.6x - 2.4y - 4.5z = -2.5$

      80) _____

A) $\{(0.2, 0.4, 0.3)\}$ B) $\{(0.5, 0.8, 0.6)\}$ C) $\{(0.4, 0.6, 0.5)\}$ D) $\{(0.1, 0.2, 0.2)\}$

Find the indicated matrix.

81) Let $C = \begin{bmatrix} 2 \\ -2 \\ 12 \end{bmatrix}$. Find $\frac{1}{2}C$.

      81) _____

A) $\begin{bmatrix} 1 \\ -2 \\ 12 \end{bmatrix}$ B) $\begin{bmatrix} 4 \\ -4 \\ 24 \end{bmatrix}$ C) $\begin{bmatrix} 1 \\ -1 \\ 6 \end{bmatrix}$ D) $\begin{bmatrix} 2 \\ -1 \\ 12 \end{bmatrix}$

Graph the parabola.

82) $y = \frac{2}{5}(x + 3)^2 + 5$

      82) _____
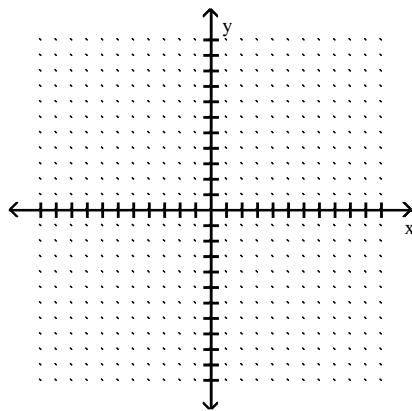
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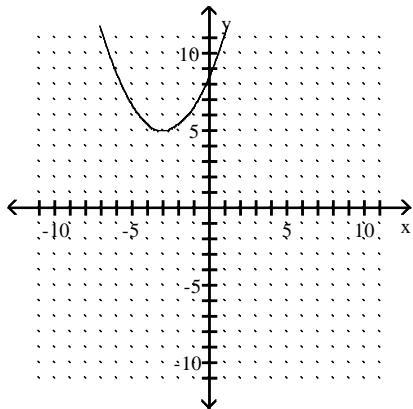
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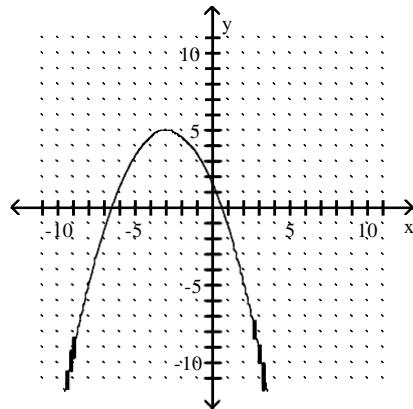
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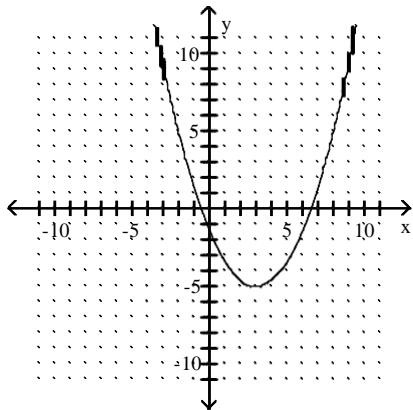
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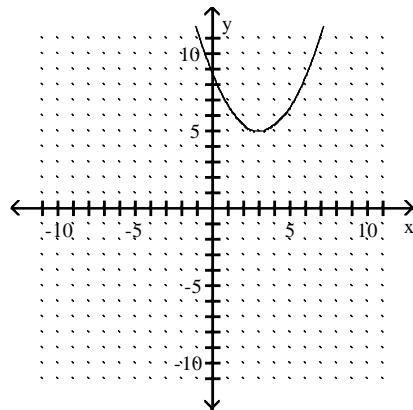
Identify the equation as a parabola, circle, ellipse, or hyperbola.

83) $y^2 = 100 - x^2$

    A) Hyperbola   B) Ellipse   C) Circle   D) Parabola

83) _____

Rewrite the series using the new index j as indicated.

84) $\displaystyle\sum_{i=1}^{23} 2^i = \sum_{j=0}$

    A) $\displaystyle\sum_{j=0}^{22} 2^{j-1}$ B) $\displaystyle\sum_{j=0}^{23} 2^{j+1}$ C) $\displaystyle\sum_{j=0}^{23} 2^{j-1}$ D) $\displaystyle\sum_{j=0}^{22} 2^{j+1}$

84) _____

Find the sum of the geometric series.

85) $3 - 9 + 27 - 81 + 243$

    A) 363   B) −363   C) 183   D) −183

85) _____

Find the slope of the line containing the pair of points.

86) $(3, -8), (3, 6)$

    A) 14   B) No slope   C) 0   D) −14

86) _____

Solve the inequality by reading the given graph. State the solution set using interval notation.

87) $x^2 + 5x < 3x + 15$ A related function is graphed below.

87) _____
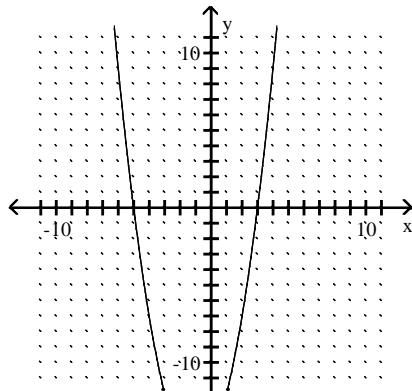
x-intercepts: (-5, 0), (3, 0)

    A) (-5, 3)   B) [-5, 3]   C) (3, 5)   D) $(-\infty, -5) \cup (3, \infty)$

Explain the behavior of the graph of f(x) as it approaches its vertical asymptote.

88) $f(x) = \dfrac{-4}{(x - 8)^2}$

88) _____

    A) Approaches $-\infty$ from the left and the right

    B) Approaches ∞ from the left, approaches $-\infty$ from the right

    C) Approaches $-\infty$ from the left, approaches ∞ from the right

    D) Approaches ∞ from the left and the right

Graph the function.

89) $f(x) = 2.346^x$

89) _____
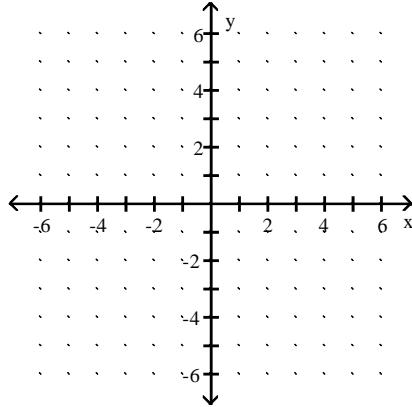
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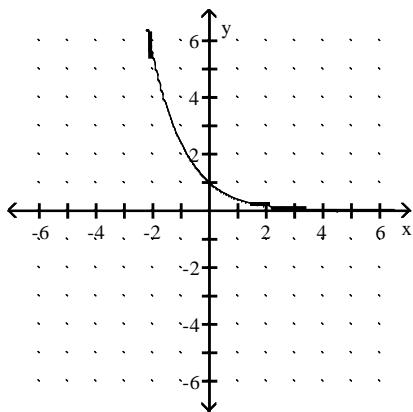
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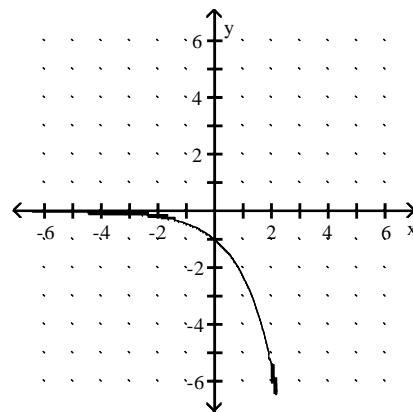
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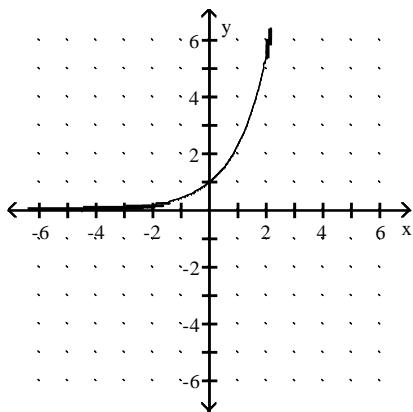
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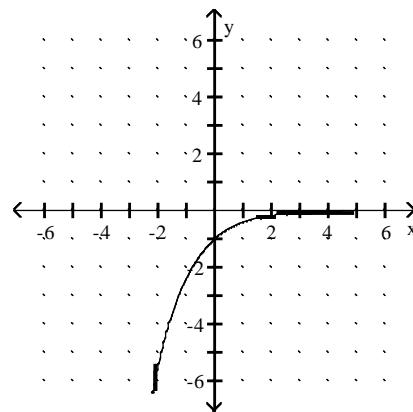
Solve the system by graphing.

90) $4x + 3y = 23$
    $-2x - 2y = -12$

90) _____
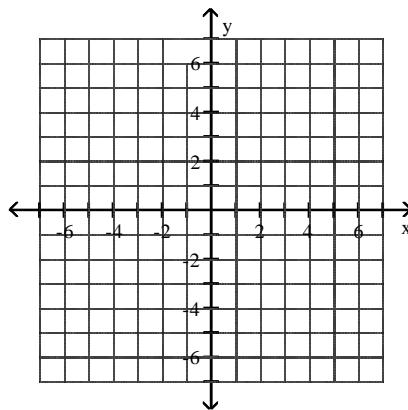
A) $\{(5, 1)\}$ B) $\{(1, 5)\}$ C) $\{(4, -4)\}$ D) $\varnothing$

Determine whether the matrix is invertible by finding the determinant of the matrix.

91) $\begin{bmatrix} -12 & 6 \\ 12 & 6 \end{bmatrix}$

91) _____

A) Not invertible   B) Invertible

Graph the hyperbola.

92) $\dfrac{y^2}{9} - \dfrac{x^2}{25} = 1$

92) _____

A)

B)

C)

D)
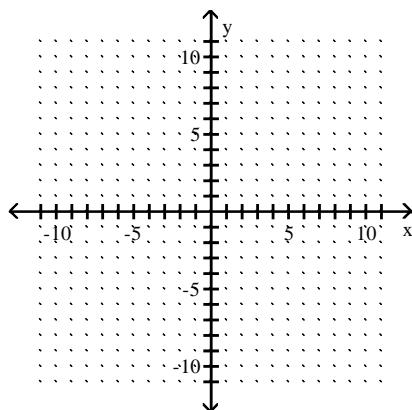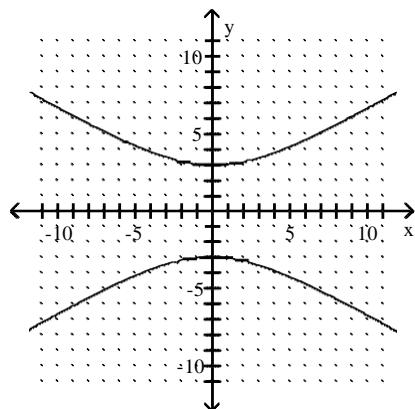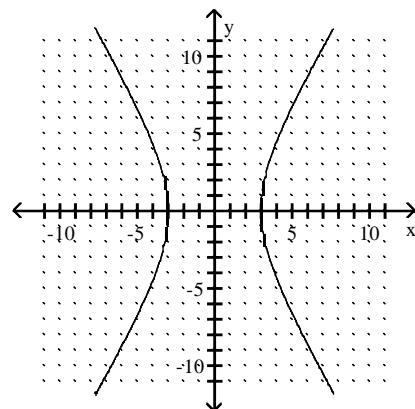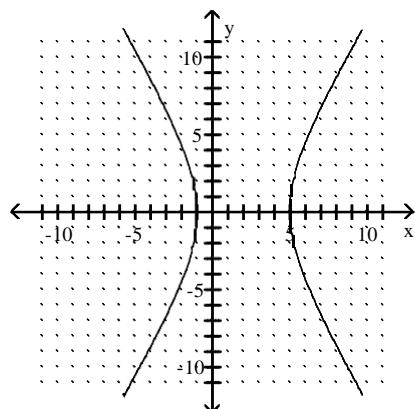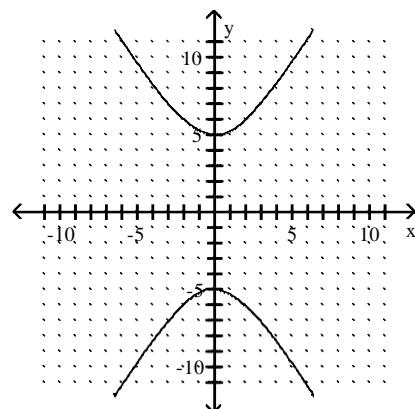
Solve the problem.

93) What is the coefficient of $x^7 y^3$ in the expansion of $(x + y)^{10}$?

93) _____

A) 604,800   B) 7   C) 86,400   D) 120

Solve the problem using your calculator.

94) Two separate tests are designed to measure a student's ability to solve problems. Several students are randomly selected to take both tests and the results are shown below. Use linear regression to find a linear function that predicts a student's score on Test B as a function of his or her score on Test A.

94) _____

Test A	48	52	58	44	43	43	40	51	59
Test B	73	67	73	59	58	56	58	64	74

A) $y = -0.930 + 19.4x$

B) $y = -19.4 - 0.930x$

C) $y = 19.4 + 0.930x$

D) $y = 0.930 - 19.4x$

Determine whether the relation is a function.

95) $\{(-6, 8), (-2, -8), (-1, -2), (-1, -2)\}$

95) _____

A) Yes

B) No

Use the rational zero theorem, Descartes's rule of signs, and the theorem on bounds as aids in finding all real and imaginary roots to the equation.

96) $x^3 + 8x^2 - 5x - 40 = 0$

96) _____

A) $-\sqrt{8}$, multiplicity 2; -5

B) $-8, -\sqrt{5}, \sqrt{5}$

C) $-\sqrt{8}$, multiplicity 2; $-\sqrt{5}$, multiplicity 2

D) $-8, -5, 5$

Solve the problem.

97) The number of bacteria growing in an incubation culture increases with time according to $B = 8400(3)^x$, where x is time in days. Find the number of bacteria when $x = 0$ and $x = 5$.

97) _____

A) 25,200; 2,041,200

B) 8400; 126,000

C) 8400; 226,800

D) 8400; 2,041,200

Graph the system of inequalities. Indicate the solution set by shading.

98) $2x + 3y \geq 6$
$x - y \leq 3$
$x \geq 1$

98) _____

26
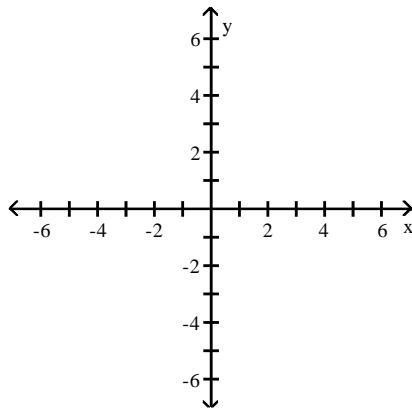
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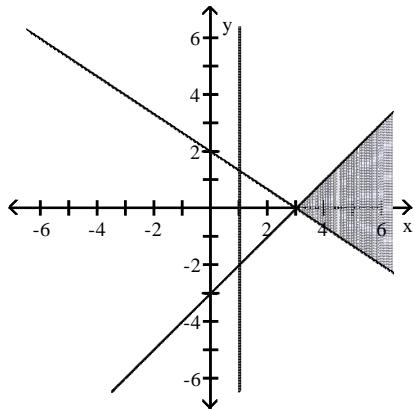
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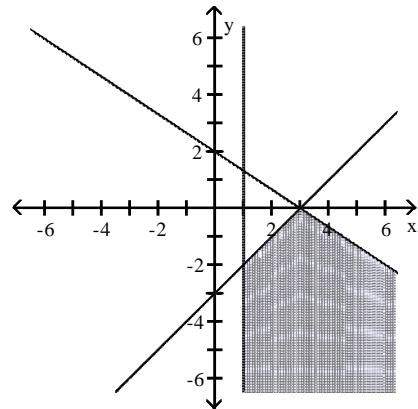
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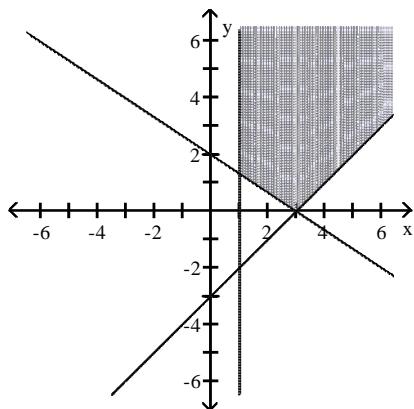
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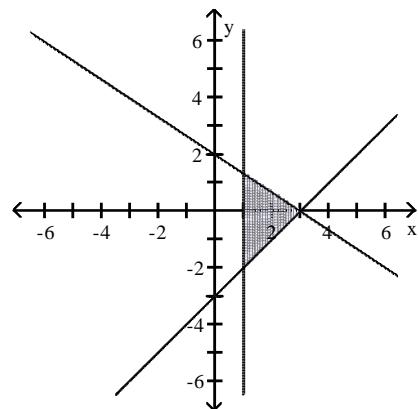
Find the values that make the equation true.

99) $\begin{bmatrix} x+3 & y+4 \\ 7 & -4 \end{bmatrix} = \begin{bmatrix} 5 & 1 \\ 7 & k \end{bmatrix}$

99) _____

    A) x = 2; y = -3; k = -4   B) x = -2; y = 3; k = 4

   C) x = 2; y = -4; k = 5   D) x = 5; y = 1; k = -4

**Graph the circle.**

100) $(x - 4)^2 + (y - 3)^2 = 9$

100) _____

A)

B)


C)

D)

28
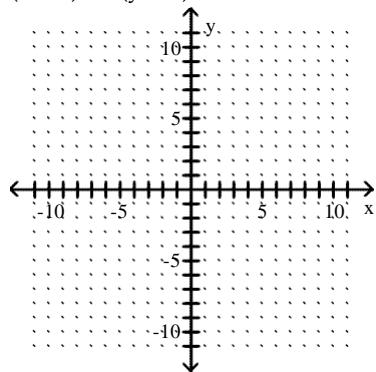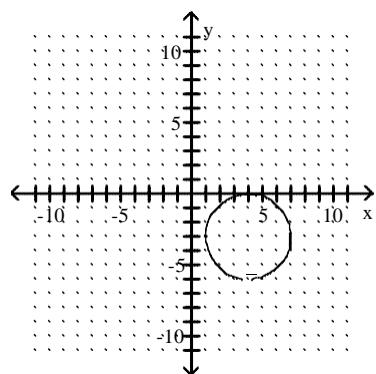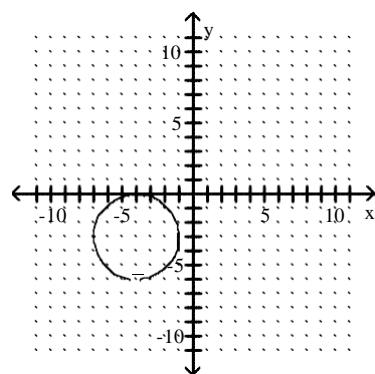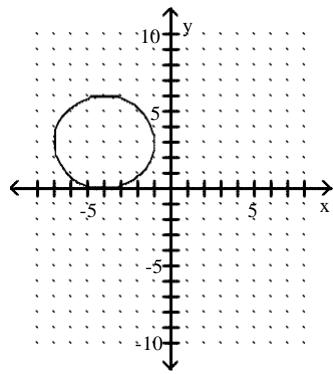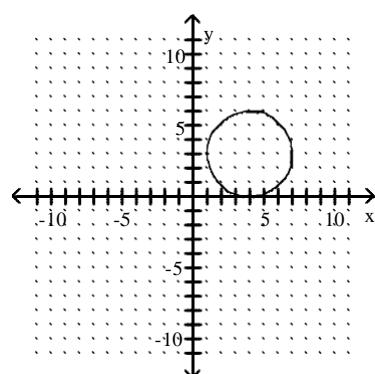
1) B		51) C	
2) A		52) A	
3) B		53) A	
4) A		54) D	
5) B		55) A	
6) A		56) A	
7) A		57) A	
8) D		58) B	
9) D		59) D	
10) C		60) A	
11) C		61) B	
12) A		62) B	
13) A		63) B	
14) C		64) A	
15) A		65) D	
16) A		66) B	
17) D		67) A	
18) D		68) B	
19) C		69) B	
20) A		70) A	
21) A		71) D	
22) B		72) C	
23) A		73) A	
24) C		74) B	
25) A		75) C	
26) C		76) C	
27) D		77) A	
28) A		78) A	
29) B		79) D	
30) C		80) B	
31) D		81) C	
32) A		82) A	
33) D		83) C	
34) C		84) D	
35) B		85) C	
36) B		86) B	
37) B		87) A	
38) C		88) A	
39) B		89) C	
40) C		90) A	
41) A		91) B	
42) B		92) A	
43) D		93) D	
44) D		94) C	
45) A		95) B	
46) A		96) B	
47) D		97) D	
48) B		98) C	
49) C		99) A	
50) C		100) D	

1)	51) _____
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