CALCULUS I/GRACEY
PRECALCULUS REVIEW Name_____

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

Find the domain of the function.

1) $g(x) = \dfrac{2x}{x^2 - 81}$ 1) _____

A) all real numbers
B) $\{x \mid x \neq 0\}$
C) $\{x \mid x > 81\}$
D) $\{x \mid x \neq -9, 9\}$

2) $\dfrac{x}{\sqrt{x - 5}}$ 2) _____

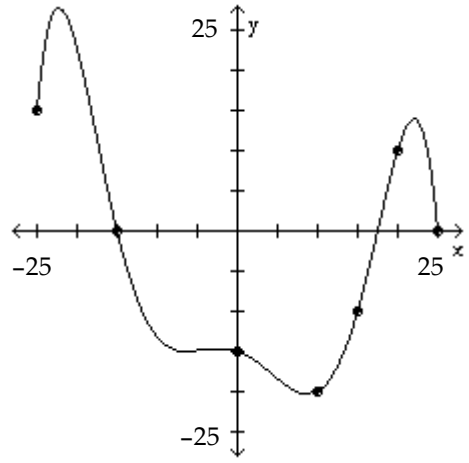
A) $\{x \mid x \neq 5\}$
B) $\{x \mid x > 5\}$
C) $\{x \mid x \geq 5\}$
D) all real numbers

3) $f(x) = \dfrac{x}{x^2 + 3}$ 3) _____

A) $\{x \mid x \neq 0\}$
B) $\{x \mid x > -3\}$
C) all real numbers
D) $\{x \mid x \neq -3\}$

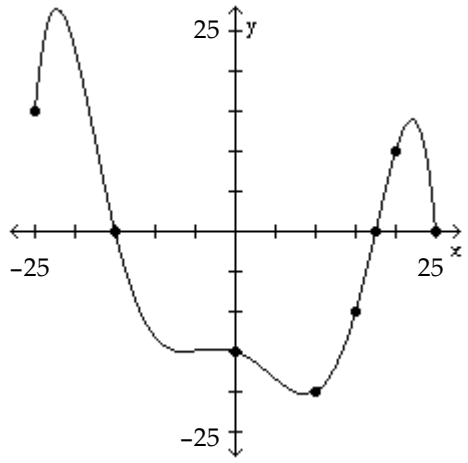
The graph of a function f is given. Use the graph to answer the question.

4) Use the graph of f given below to find f(–15). 4) _____



A) 25 B) 0 C) –10 D) –15

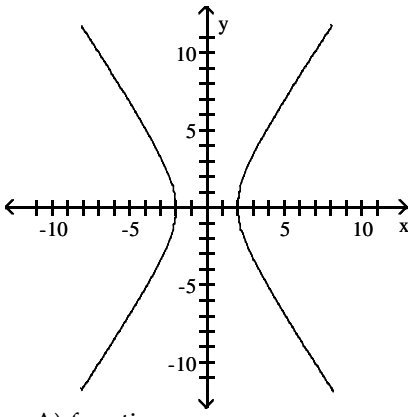
5) For what numbers x is f(x) = 0? 5) _____



A) (–25, –15), (17.5, 25)
B) (–15, 17.5)
C) –15, 17.5, 25
D) –15

Determine whether the graph is that of a function. If it is, use the graph to find its domain and range, the intercepts, if any, and any symmetry with respect to the x–axis, the y–axis, or the origin.

6) 6) _____



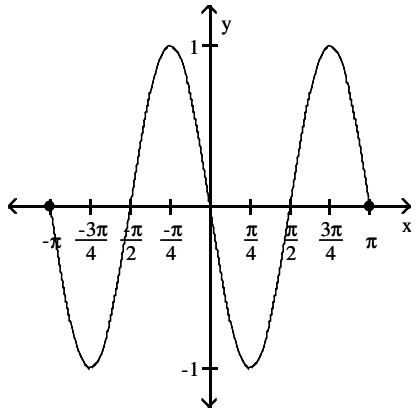
A) function
domain: {x | –2 ≤ x ≤ 2}
range: all real numbers
intercepts: (–2, 0), (2, 0)
symmetry: x–axis, y–axis

B) function
domain: all real numbers
range: {y | y ≤ –2 or y ≥ 2}
intercepts: (–2, 0), (2, 0)
symmetry: y–axis

C) function
domain: {x | x ≤ –2 or x ≥ 2}
range: all real numbers
intercepts: (–2, 0), (2, 0)
symmetry: x–axis, y–axis, origin

D) not a function

7) 7) _____



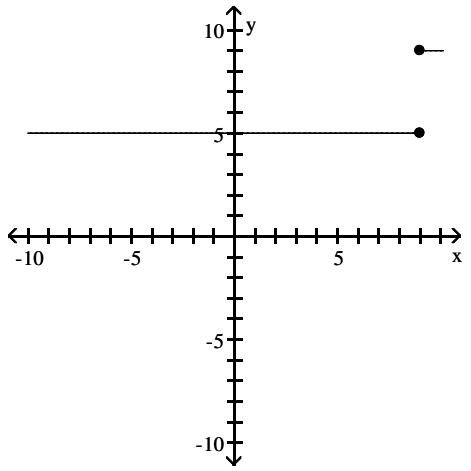
A) function
domain: {x | –1 ≤ x ≤ 1}
range: {y | –π ≤ y ≤ π}
intercepts: $(-\pi, 0), (-\frac{\pi}{2}, 0), (0, 0), (\frac{\pi}{2}, 0), (\pi, 0)$
symmetry: none

B) function
domain: all real numbers
range: {y | –1 ≤ y ≤ 1}
intercepts: $(-\pi, 0), (-\frac{\pi}{2}, 0), (0, 0), (\frac{\pi}{2}, 0), (\pi, 0)$
symmetry: origin

C) function
domain: {x | –π ≤ x ≤ π}
range: {y | –1 ≤ y ≤ 1}
intercepts: $(-\pi, 0), (-\frac{\pi}{2}, 0), (0, 0), (\frac{\pi}{2}, 0), (\pi, 0)$
symmetry: origin

D) not a function

8) 8) _____



A) function
domain: {x | x = 9 or x = 5}
range: all real numbers
intercept: (5, 0)
symmetry: x–axis

B) function
domain: all real numbers
range: all real numbers
intercept: (0, 5)
symmetry: none

C) function
domain: all real numbers
range: {y | y = 9 or y = 5}
intercept: (0, 5)
symmetry: none

D) not a function

Answer the question about the given function.

9) Given the function $f(x) = \frac{x^2 - 7}{x - 1}$, if x = –2, what is f(x)? What point is on the graph of f? 9) _____

A) 1; (1, –2)

B) $-\frac{11}{3}$; $(-\frac{11}{3}, -2)$

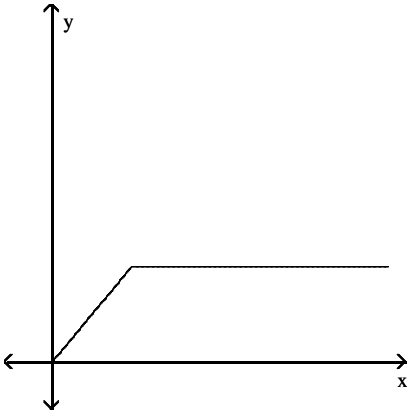
C) 1; (–2, 1)

D) $-\frac{11}{3}$; $(-2, -\frac{11}{3})$

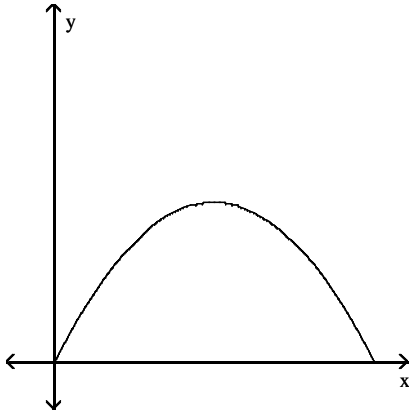
Match the function with the graph that best describes the situation.

10) The height of an animal as a function of time. 10) _____

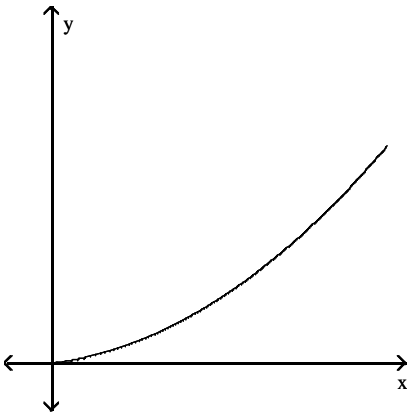
A)



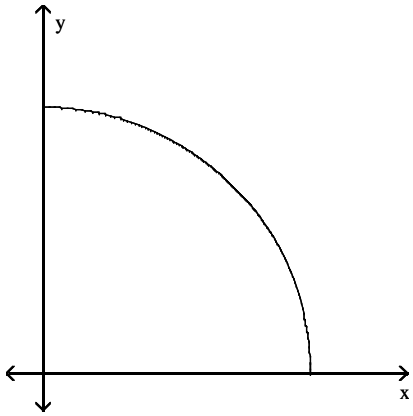
B)



C)

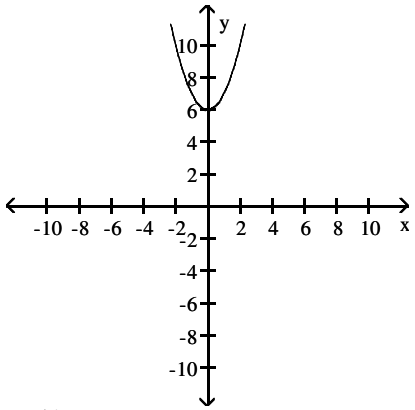


D)



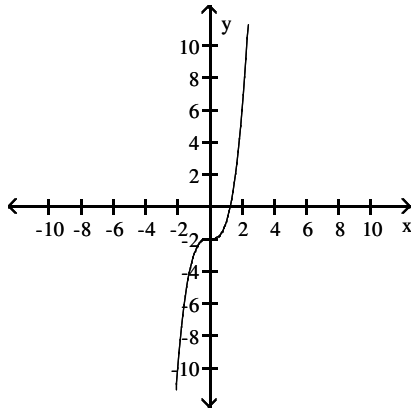
The graph of a function is given. Decide whether it is even, odd, or neither.

11) 11) _____



A) even B) odd C) neither

12) 12) _____



A) even B) odd C) neither

Determine algebraically whether the function is even, odd, or neither.

13) $f(x) = 4x^3$ 13) _____

A) even B) odd C) neither

14) $f(x) = 3x^3 - 5$ 14) _____

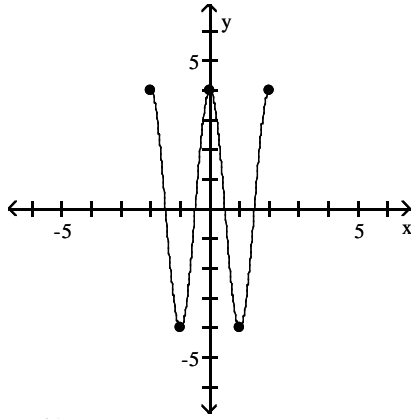
A) even B) odd C) neither

15) $f(x) = \dfrac{-x^3}{4x^2 + 3}$ 15) _____

A) even B) odd C) neither

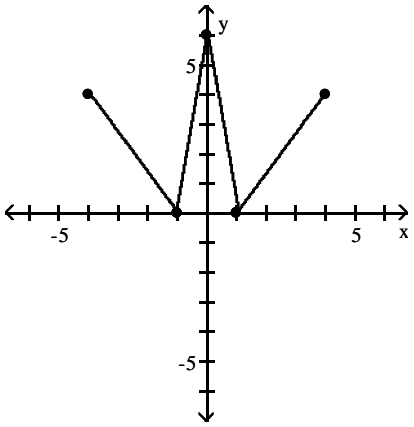
The graph of a function is given. Determine whether the function is increasing, decreasing, or constant on the given interval.

16) (– 2, – 1) 16) _____



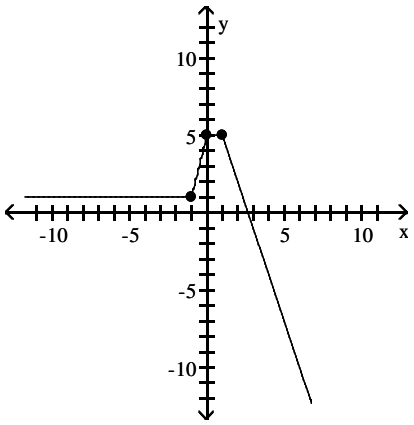
A) increasing B) constant C) decreasing

17) (1, 4) 17) _____



A) decreasing B) constant C) increasing

18) (0, 1) 18) _____



A) decreasing B) increasing C) constant

For the function, find the average rate of change of f from 1 to x:

$\frac{\mathbf{f(x) - f(1)}}{\mathbf{x - 1}}$**, x ≠ 1**

19) f(x) = –5x 19) _____

A) 0 B) –6 C) –5 D) $\frac{-5}{x - 1}$

20) f(x) = $\sqrt{x + 15}$ 20) _____

A) $\frac{\sqrt{x + 15} + 4}{x + 1}$ B) $\frac{\sqrt{x + 15} - 4}{x - 1}$ C) $\frac{\sqrt{x + 15} - 4}{x + 1}$ D) $\frac{\sqrt{x + 15} + 4}{x - 1}$

Find the average rate of change for the function between the given values.

21) f(x) = –4x + 8; from 1 to 2 21) _____

A) –4 B) 4 C) –8 D) 8

Find an equation of the secant line containing (1, f(1)) and (2, f(2)).

22) $f(x) = \frac{3}{x+2}$ 22) _____

A) $y = \frac{1}{4}x + \frac{5}{3}$ B) $y = -\frac{1}{4}x + \frac{5}{4}$ C) $y = \frac{1}{4}x + \frac{3}{4}$ D) $y = \frac{3}{4}x + \frac{1}{4}$

23) $f(x) = \sqrt{x+35}$ 23) _____

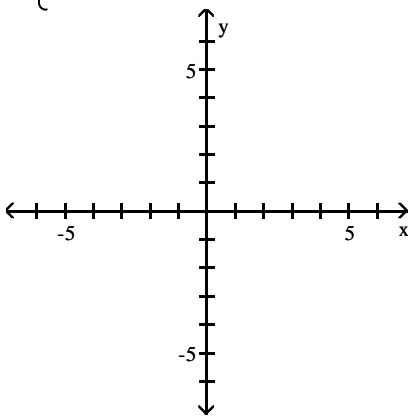
A) $y = (-\sqrt{37} + 6)x + \sqrt{37} - 12$ B) $y = (\sqrt{37} - 6)x + \sqrt{37} - 12$

C) $y = (-\sqrt{37} - 6)x - \sqrt{37} + 12$ D) $y = (\sqrt{37} - 6)x - \sqrt{37} + 12$

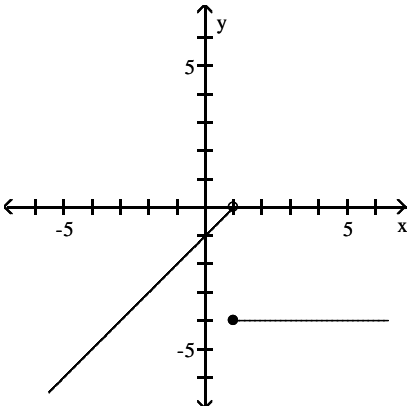
Graph the function.

24) 24) _____

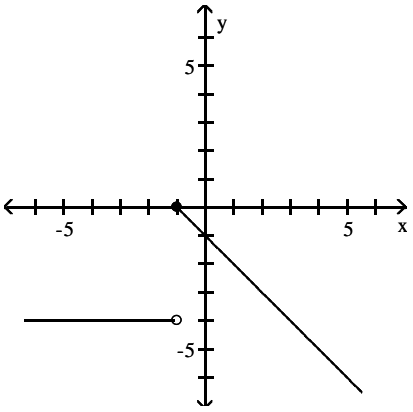
$$f(x) = \begin{cases} x - 1 & \text{if } x < 1 \\ -4 & \text{if } x \geq 1 \end{cases}$$



A)



B)



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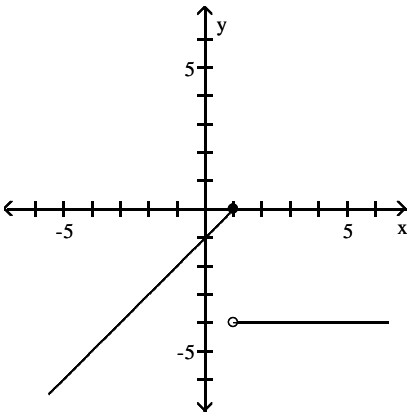
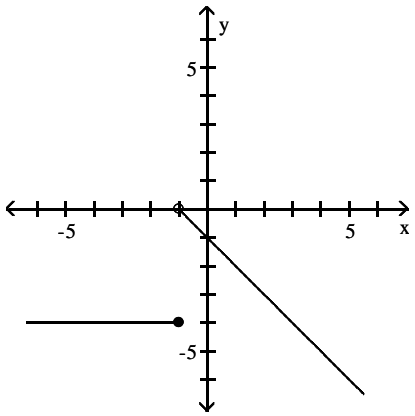
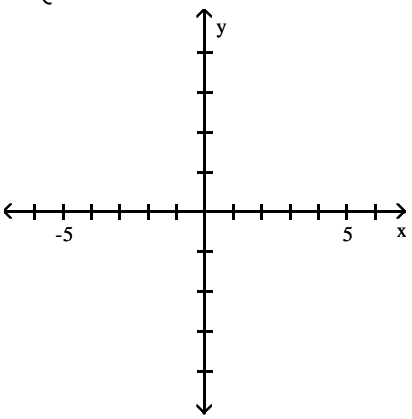


D)

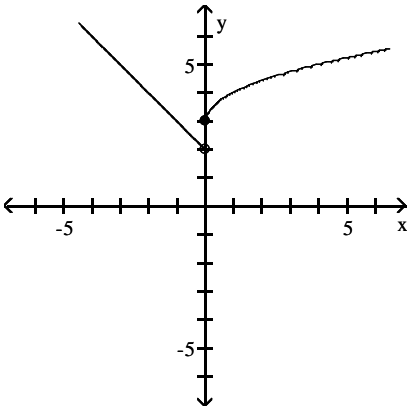


25) 25) _____

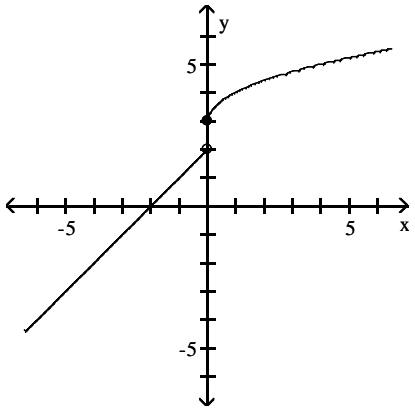
$$f(x) = \begin{cases} -x + 2 & x < 0 \\ \sqrt{x} + 3 & x \geq 0 \end{cases}$$



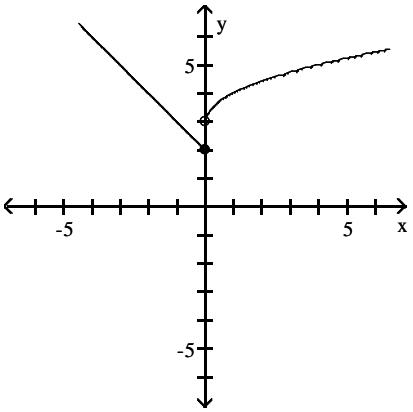
A)



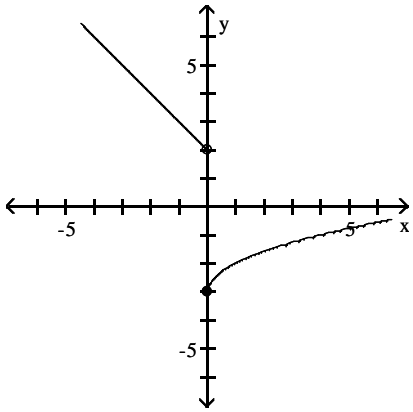
B)



C)

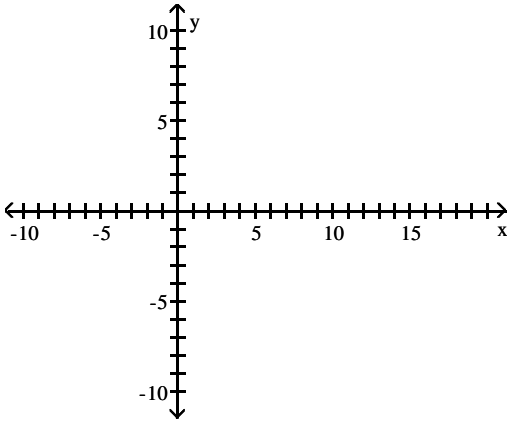


D)

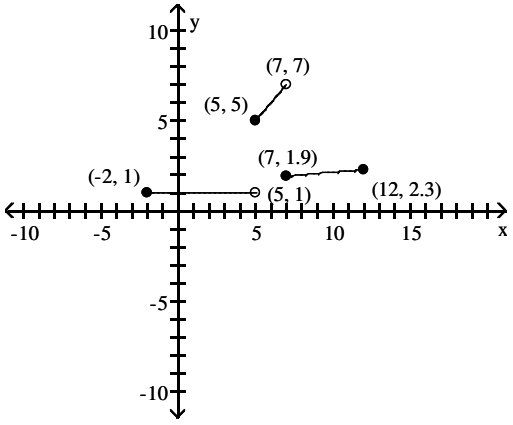


26) 26) _____

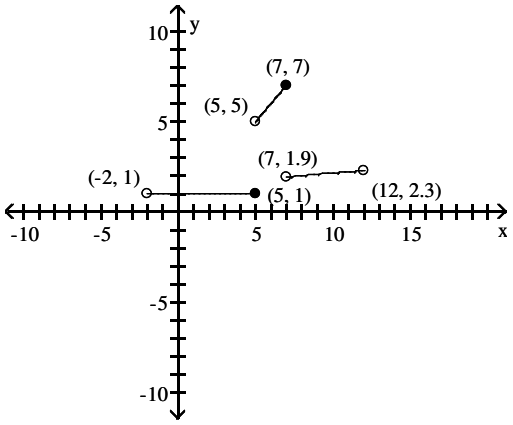
$$f(x) = \begin{cases} 1 & \text{if } -2 \le x < 5 \\ |x| & \text{if } 5 \le x < 7 \\ \sqrt[3]{x} & \text{if } 7 \le x \le 12 \end{cases}$$



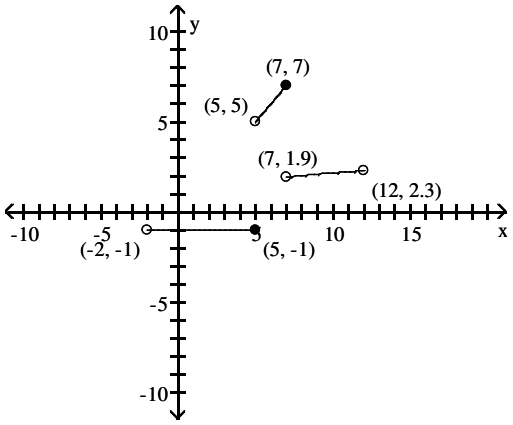
A)



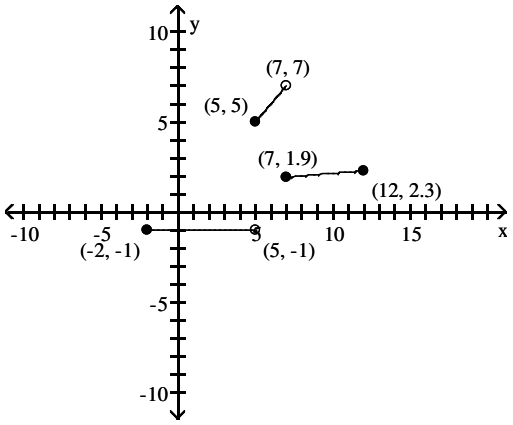
B)



C)



D)



Find the domain of the function.

27) 27) _____

$$f(x) = \begin{cases} 4x & \text{if } x \neq 0 \\ 3 & \text{if } x = 0 \end{cases}$$

A) {0}
B) $\{x \mid x \leq 0\}$
C) all real numbers
D) $\{x \mid x \neq 0\}$

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

Solve the problem.

28) A cellular phone plan had the following schedule of charges: 28) _____

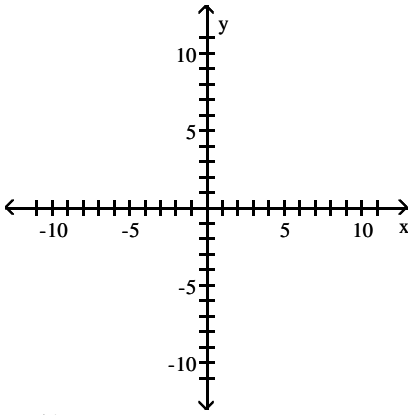
Basic service, including 100 minutes of calls	$20.00 per month
2nd 100 minutes of calls	$0.075 per minute
Additional minutes of calls	$0.10 per minute

What is the charge for 200 minutes of calls in one month?
What is the charge for 250 minutes of calls in one month?
Construct a function that relates the monthly charge C for x minutes of calls.

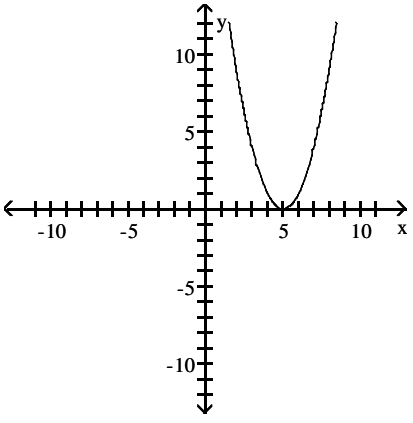
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the function by starting with the graph of the basic function and then using the techniques of shifting compressing, stretching, and/or reflecting.

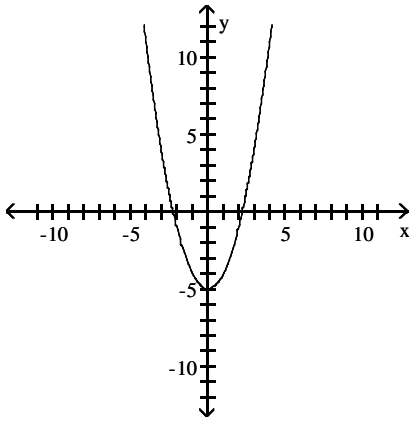
29) $f(x) = x^2 - 5$ 29) _____



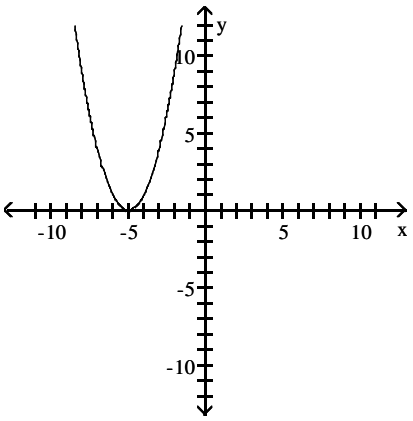
A)



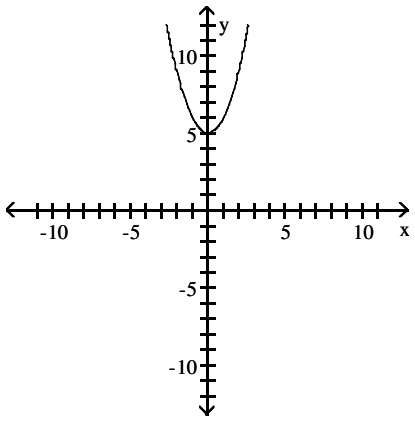
B)



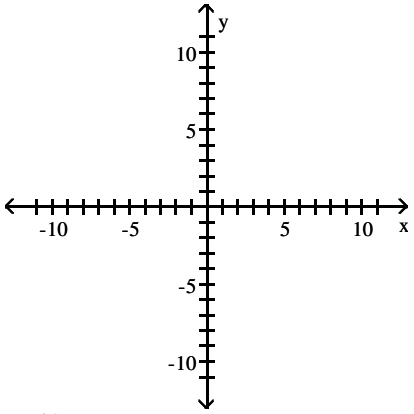
C)



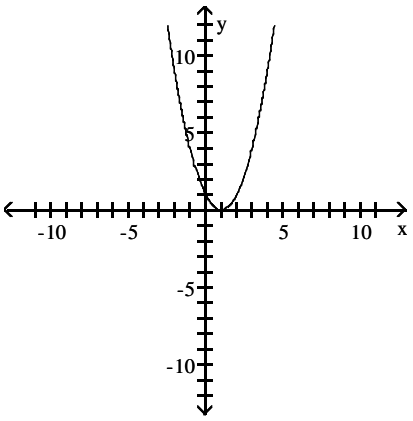
D)



30) $f(x) = (x + 1)^2$ 30) _____



A)



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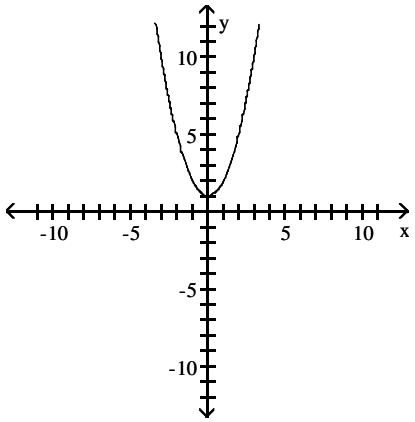
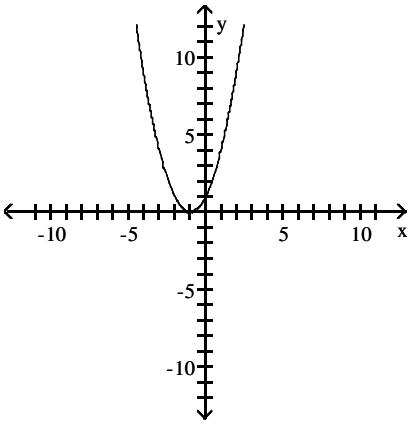
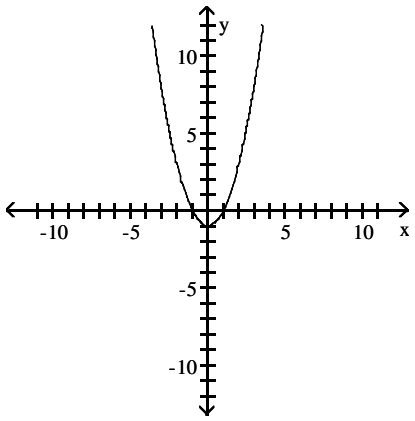


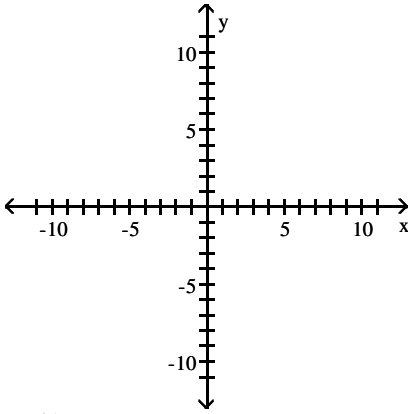
C)



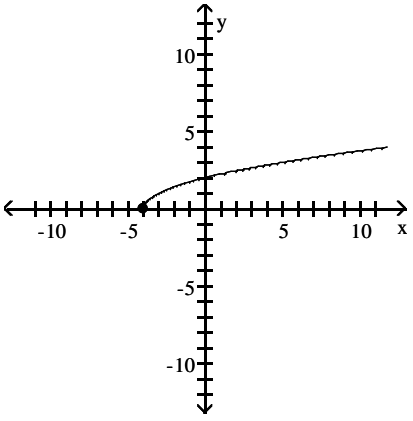
D)



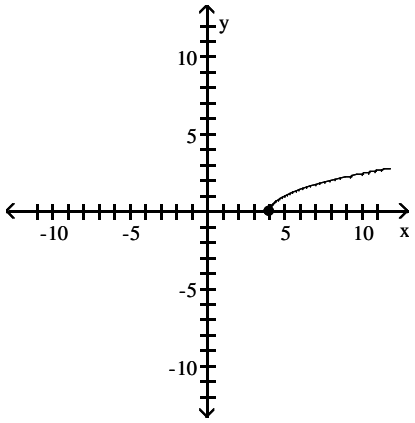
31) $f(x) = \sqrt{x} - 4$ 31) _____



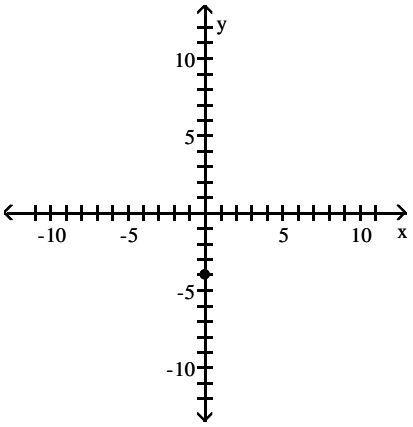
A)



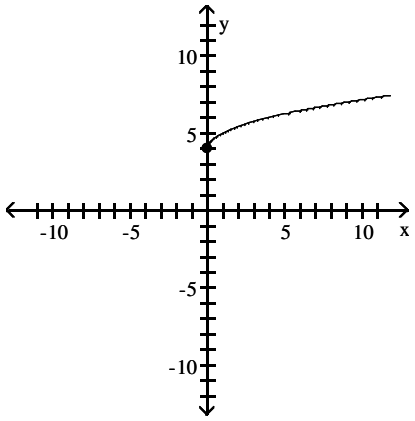
B)



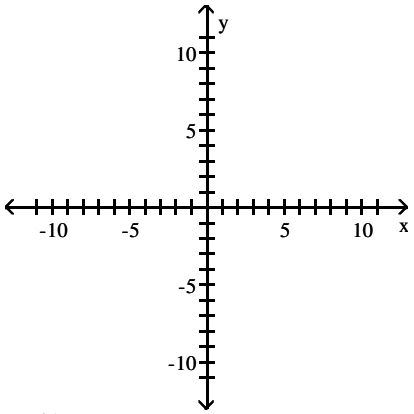
C)



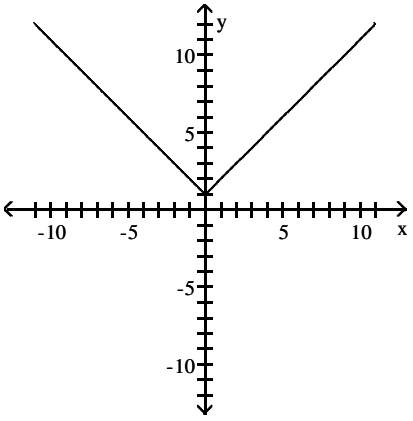
D)



32) $f(x) = |x - 1|$ 32) _____



A)



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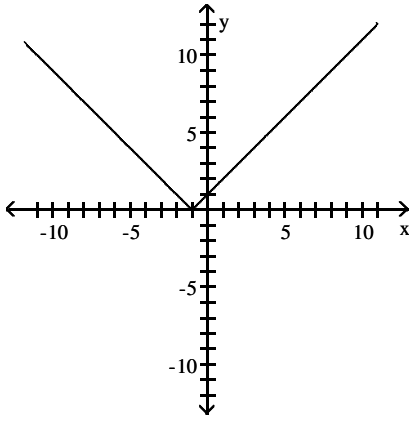

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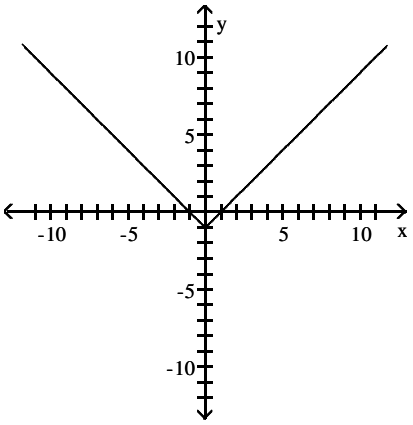

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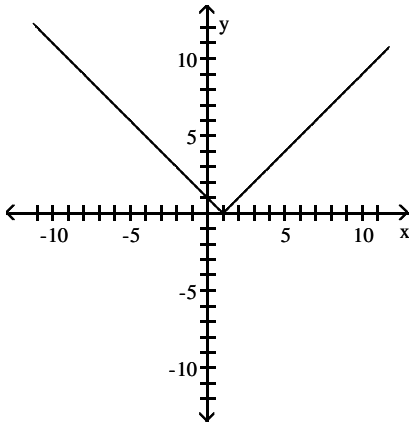
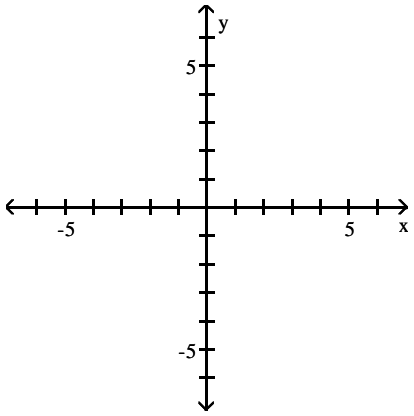
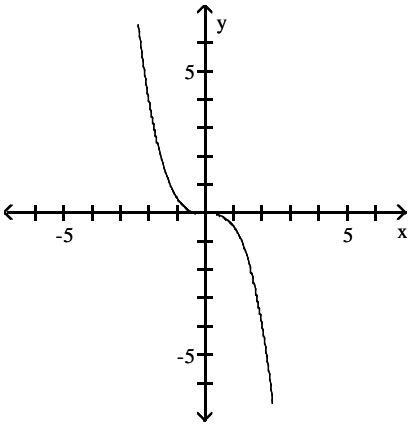


33) $f(x) = \frac{1}{2}x^3$ 33) _____



A)



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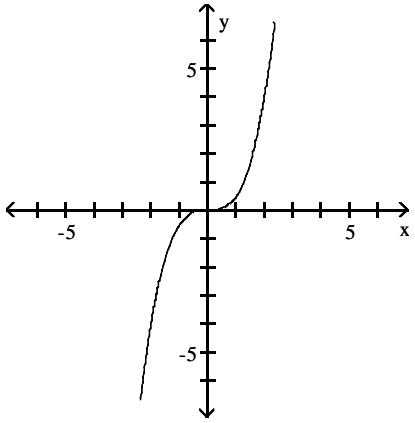

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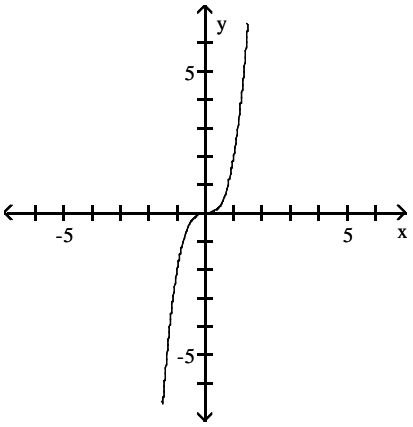

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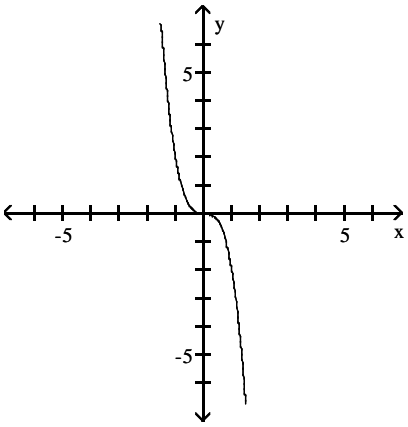
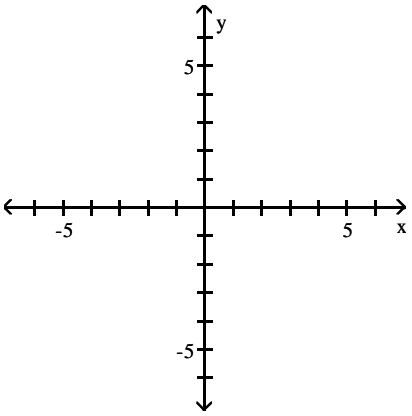
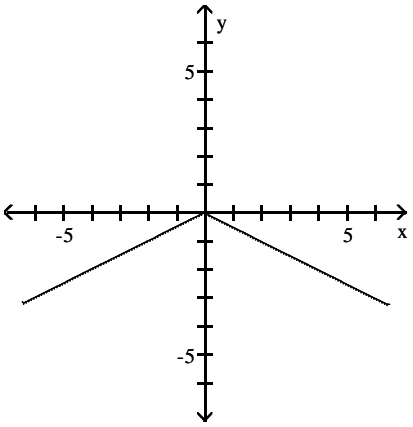


34) $f(x) = 2|x|$ 34) _____



A)



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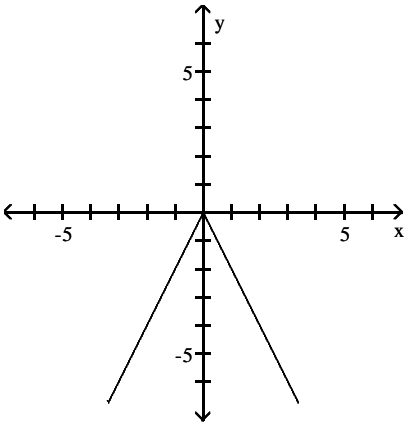

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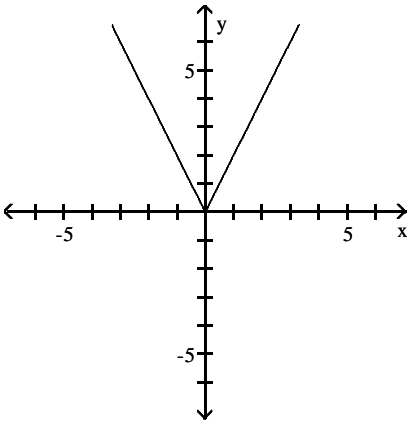

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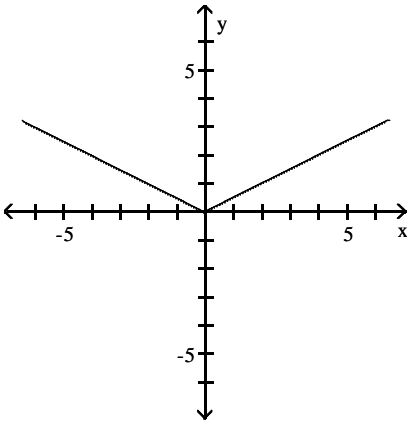
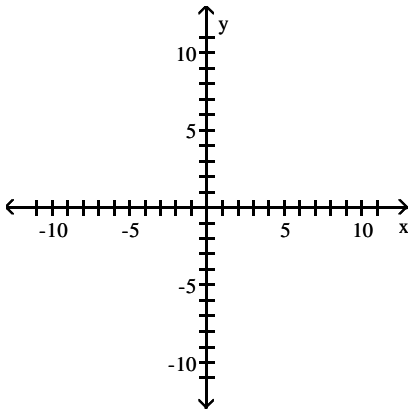


35) $f(x) = 2(x + 1)^2 - 3$ 35) _____



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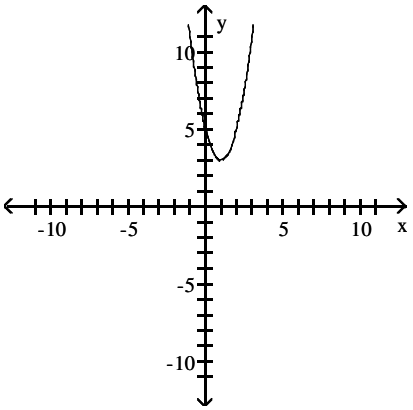

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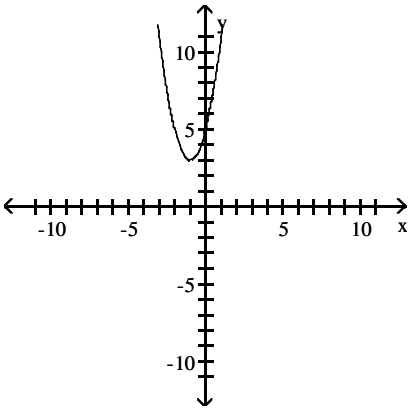

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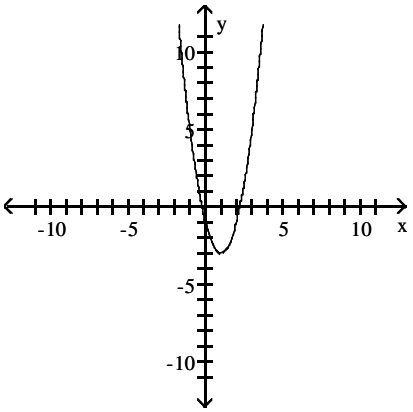

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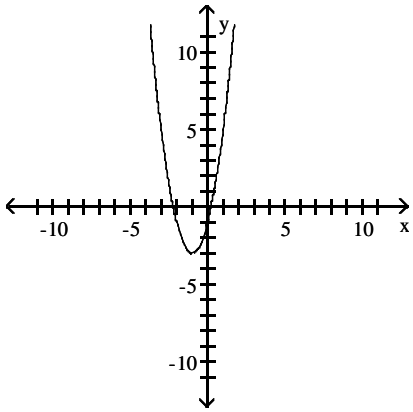
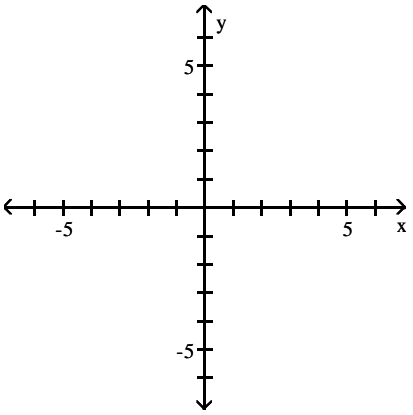


36) $f(x) = (-x)^2$ 36) _____



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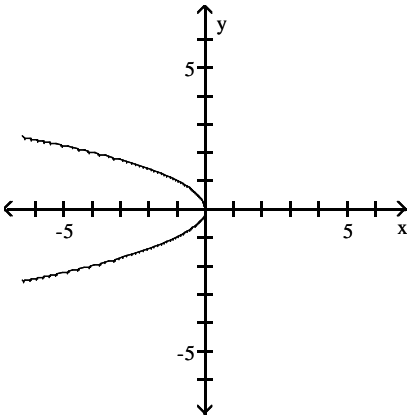

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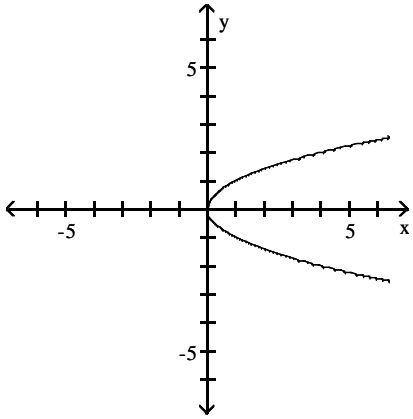

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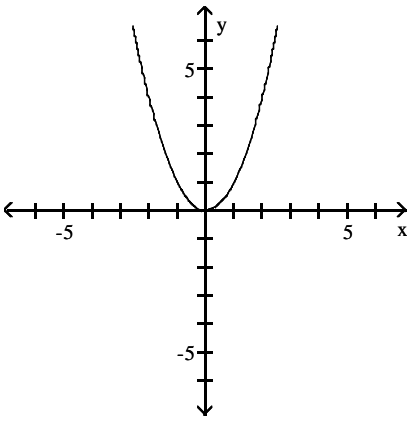

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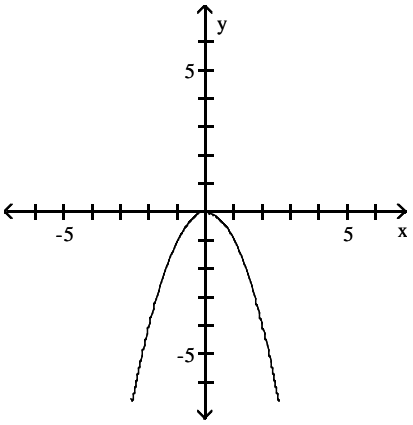
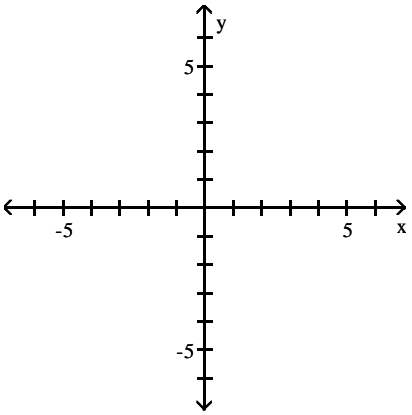
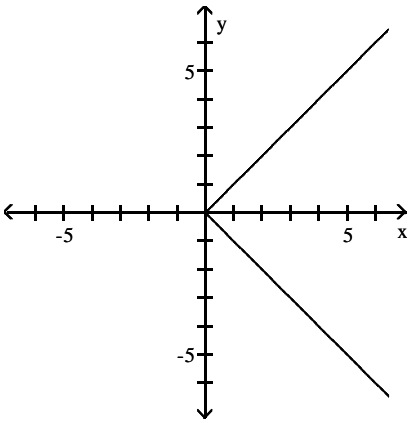


37) $f(x) = -|x|$ 37) _____



A)



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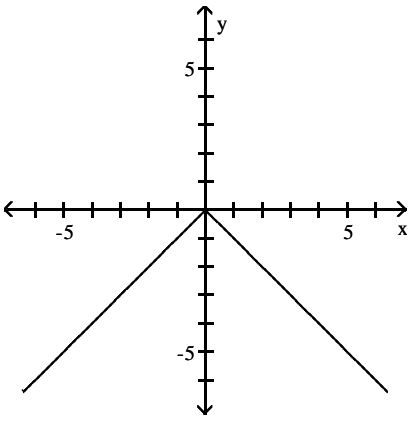

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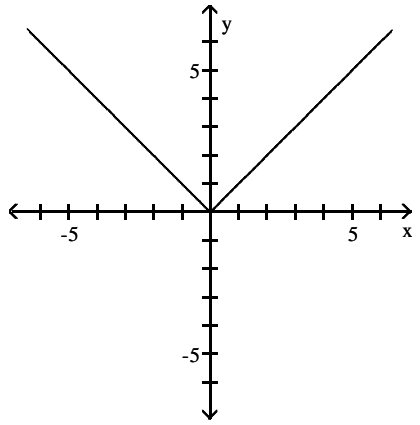
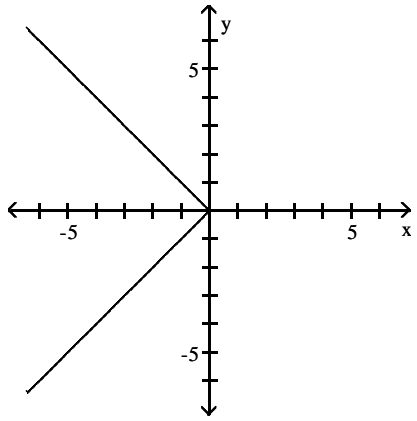


D)



Find the function.

38) Find the function that is finally graphed after the following transformations are applied to the graph of $y = \sqrt{x}$. The graph is shifted up 4 units, reflected about the x–axis, and finally shifted right 6 units. 38) _____

A) $y = -\sqrt{x - 6} - 4$ B) $y = -\sqrt{x + 6} - 4$ C) $y = \sqrt{-x + 6} + 4$ D) $y = -\sqrt{x - 6} + 4$

Solve the problem.

39) Elissa wants to set up a rectangular dog run in her backyard. She has 36 feet of fencing to work with and wants to use it all. If the dog run is to be x feet long, express the area of the dog run as a function of x. 39) _____

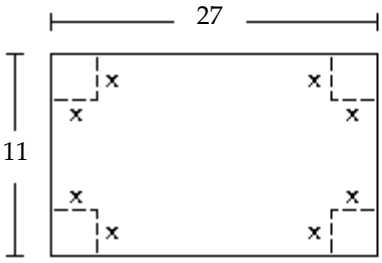
A) $A(x) = 19x - x^2$ B) $A(x) = 20x^2 - x$ C) $A(x) = 18x - x^2$ D) $A(x) = 17x - x^2$

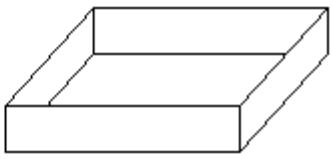
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

40) A right triangle has one vertex on the graph of $y = x^2$ at (x, y), another at the origin, and the third on the (positive) y–axis at (0, y). Express the area A of the triangle as a function of x. 40) _____

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

41) A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 11 inches by 27 inches by cutting out equal squares of side x at each corner and then folding up the sides as in the figure. Express the volume V of the box as a function of x. 41) _____





A) $V(x) = (11 - x)(27 - x)$ B) $V(x) = x(11 - 2x)(27 - 2x)$

C) $V(x) = (11 - 2x)(27 - 2x)$ D) $V(x) = x(11 - x)(27 - x)$

Use factoring to find the zeros of the quadratic function. List the x–intercepts of the graph of the function.

42) $f(x) = x^2 + 5x - 50$ 42) _____

A) $x = -10, x = 1$ B) $x = 10, x = -5$ C) $x = 10, x = 5$ D) $x = -10, x = 5$

43) $F(x) = x^2 - x - 56$ 43) _____

A) $x = -7, x = -8$ B) $x = 7, x = 8$ C) $x = 1, x = 56$ D) $x = -7, x = 8$

44) $g(x) = 121x^2 - 1$ 44) _____

A) $x = \frac{1}{11}, x = -\frac{1}{11}$ B) $x = \frac{1}{11}$

C) $x = \frac{1}{11}, x = 0$ D) $x = -\frac{1}{11}$

Find the zeros of the quadratic function using the Square Root Method. List the x–intercepts of the graph of the function.

45) $F(x) = x^2 - 5$ 45) _____

A) $x = 5$ B) $x = -5, x = 5$ C) $x = \sqrt{5}, x = -\sqrt{5}$ D) $x = \sqrt{5}$

46) $G(x) = (2x - 1)^2 - 121$ 46) _____

A) $x = -12, x = 10$ B) $x = -5, x = 6$ C) $x = -10, x = 12$ D) $x = -6, x = 5$

Find the zeros of the quadratic function by completing the square. List the x–intercepts of the graph of the function.

47) $f(x) = x^2 - 10x + 21$ 47) _____

A) $x = -7, x = -3$ B) $x = 7, x = 3$ C) $x = \sqrt{2}, x = -1$ D) $x = 18, x = 3$

48) $F(x) = x^2 + 8x + 7$ 48) _____

A) $x = -1, x = -7$ B) $x = \sqrt{7}, x = \sqrt{-7}$ C) $x = 14, x = -7$ D) $x = 1, x = 7$

Find the real zeros, if any, of each quadratic function using the quadratic formula. List the x–intercepts, if any, of the graph of the function.

49) $g(x) = x^2 - 12 - 5x$ 49) _____

A) $x = 5, x = 12$ B) $x = \frac{5 + \sqrt{73}}{2}$

C) $x = \frac{5 \pm \sqrt{73}}{2}$ D) No real zeros or x–intercepts

50) $F(x) = 5x^2 - 7x - 1$ 50) _____

A) $x = \frac{-7 \pm \sqrt{69}}{10}$ B) $x = \frac{7 + \sqrt{69}}{10}$

C) $x = \frac{7 \pm \sqrt{69}}{10}$ D) No real zeros or x–intercepts

Solve f(x) = g(x). Find the points of intersection of the graphs of the two functions.

51) $f(x) = 7x + 8$ 51) _____

$g(x) = x^2$

A) $x = -1, x = 8$ B) $x = 1, x = -\frac{1}{8}$ C) $x = 1, x = 8$ D) $x = -1, x = \frac{1}{8}$

52) $f(x) = 5x^2$
$g(x) = -9x$ 52) _____

A) $x = \pm\frac{9}{5}$ B) $x = -\frac{9}{5}, x = 0$ C) $x = \frac{9}{5}, x = 0$ D) $x = 0$

Find the real zeros of the function. List the x-intercepts of the graph of the function.

53) $G(x) = x^4 - 20x^2 - 125$ 53) _____

A) $x = -\sqrt{5}, x = \sqrt{5}$ B) $x = -5, x = 5$ C) $x = -25, x = 5$ D) no real solution

54) $Q(x) = (-7x - 5)^2 + 10(-7x - 5) + 24$ 54) _____

A) $x = -4, x = -6$ B) $x = \frac{1}{7}, x = -\frac{1}{7}$ C) $x = -\frac{1}{7}, x = \frac{1}{7}$ D) $x = \frac{9}{7}, x = \frac{11}{7}$

Solve the problem.

55) A ball is thrown vertically upward from the top of a building 144 feet tall with an initial velocity of 128 feet per second. The distance s (in feet) of the ball from the ground after t seconds is $s = 144 + 128t - 16t^2$. After how many seconds will the ball pass the top of the building on its way down? 55) _____

A) 144 sec B) 10 sec C) 7 sec D) 8 sec

56) The length of a vegetable garden is 5 feet longer than its width. If the area of the garden is 50 square feet, find its dimensions. 56) _____

A) 5 ft by 10 ft B) 4 ft by 11 ft C) 4 ft by 9 ft D) 6 ft by 11 ft

Solve the equation.

57) $|b + 6| + 4 = 13$ 57) _____

A) {–15, 3} B) {–3, 15} C) ∅ D) {3}

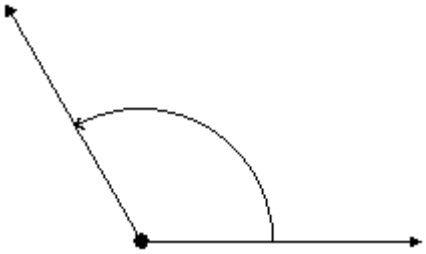
58) $\left|x^2 + 7x + 10\right| = 0$ 58) _____

A) {–5, –2} B) {–10, –4} C) {5, 2} D) {10, 4}

Draw the angle.

59) $\frac{2\pi}{3}$ 59) _____

A)



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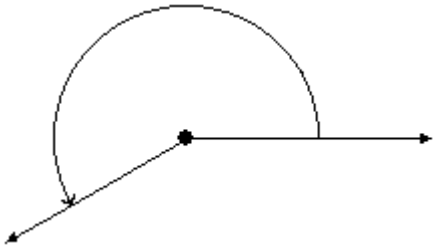

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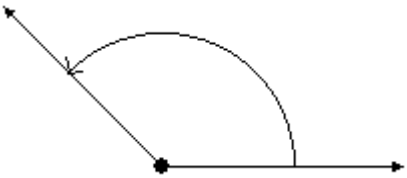

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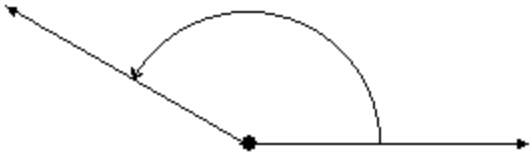
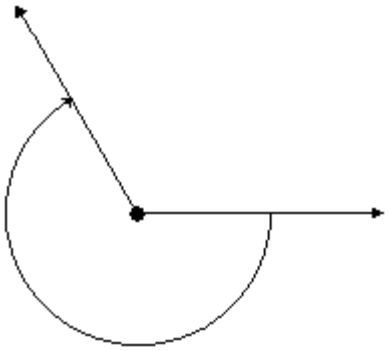


60) $-\frac{7\pi}{6}$ 60) _____

A)



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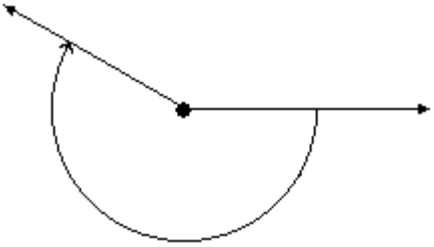

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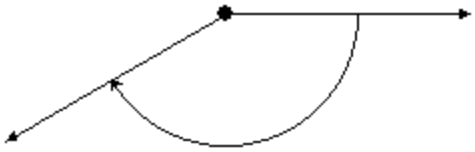
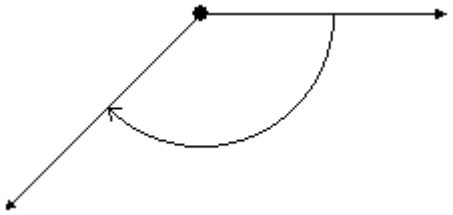


D)



If s denotes the length of the arc of a circle of radius r subtended by a central angle θ, find the missing quantity.

61) r = 1.12 centimeters, θ = 4.5 radians, s = ? 61) _____

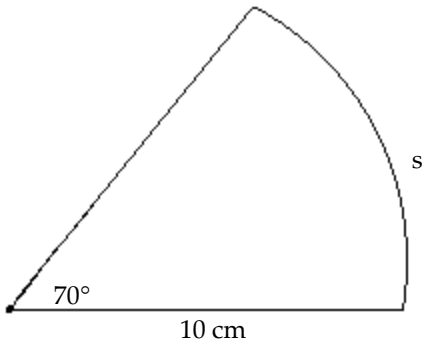
A) 4 cm B) 7 cm C) 5 cm D) 6 cm

62) r = $\frac{1}{5}$ feet, s = 4 feet, θ = ? 62) _____

A) $\frac{4}{5}$ radians B) 20° C) 20 radians D) $\frac{4}{5}$°

Find the length s. Round the answer to three decimal places.

63) 63) _____



A) 9.774 cm B) 10.995 cm C) 12.217 cm D) 13.439 cm

Convert the angle in degrees to radians. Express the answer as multiple of π.

64) 30° 64) _____

A) $\frac{\pi}{5}$ B) $\frac{\pi}{8}$ C) $\frac{\pi}{6}$ D) $\frac{\pi}{7}$

65) −144° 65) _____

A) $-\frac{5\pi}{6}$ B) $-\frac{3\pi}{4}$ C) $-\frac{4\pi}{5}$ D) $-\frac{5\pi}{4}$

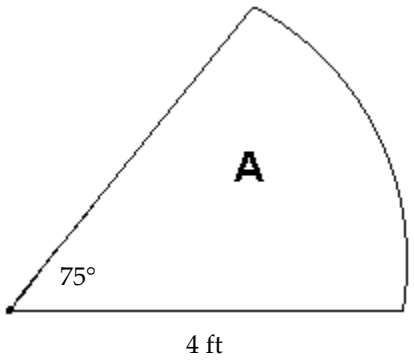
If A denotes the area of the sector of a circle of radius r formed by the central angle θ, find the missing quantity. If necessary, round the answer to two decimal places.

66) r = 20 inches, θ = 30°, A = ? 66) _____

A) 5.23 in^2 B) 104.67 in^2 C) 10.47 in^2 D) 209.33 in^2

Find the area A. Round the answer to three decimal places.

67) 67) _____



A) 2.618 ft^2 B) 20.944 ft^2 C) 10.472 ft^2 D) 3.333 ft^2

Solve the problem.

68) The blade of a windshield wiper sweeps out an angle of 135° in one cycle. The base of the blade is 12 inches from the pivot point and the tip is 32 inches from the pivot point. What area does the wiper cover in one cycle? (Round to the nearest 0.1 square inch.) 68) _____

A) 1041.8 in^2 B) 948.3 in^2 C) 1105.3 in^2 D) 1036.7 in^2

69) A car is traveling at 29 mph. If its tires have a diameter of 25 inches, how fast are the car's tires turning? Express the answer in revolutions per minute. If necessary, round to two decimal places. 69) _____

A) 381.92 rpm B) 779.83 rpm C) 389.92 rpm D) 2449.92 rpm

In the problem, t is a real number and P = (x, y) is the point on the unit circle that corresponds to t. Find the exact value of the indicated trigonometric function of t.

70) $(\frac{5}{6}, \frac{\sqrt{11}}{6})$ Find sin t. 70) _____

A) $\frac{5}{6}$ B) $\frac{\sqrt{11}}{5}$ C) $\frac{5\sqrt{11}}{11}$ D) $\frac{\sqrt{11}}{6}$

71) $(\frac{\sqrt{7}}{4}, \frac{3}{4})$ Find sec t. 71) _____

A) $\frac{4\sqrt{7}}{7}$ B) $\frac{3\sqrt{7}}{7}$ C) $\frac{\sqrt{7}}{3}$ D) $\frac{4}{3}$

72) $(-\frac{\sqrt{55}}{8}, \frac{3}{8})$ Find cot t. 72) _____

A) $\frac{3}{8}$ B) $\frac{\sqrt{55}}{8}$ C) $-\frac{\sqrt{55}}{3}$ D) $-\frac{8}{3}$

73) $(\frac{2}{9}, -\frac{\sqrt{77}}{9})$ Find cos t. 73) _____

A) $\frac{\sqrt{77}}{9}$ B) $-\frac{2}{9}$ C) $-\frac{\sqrt{77}}{9}$ D) $\frac{2}{9}$

Find the exact value. Do not use a calculator.

74) sin 0 74) _____

A) 1 B) $\frac{\sqrt{2}}{2}$ C) 0 D) undefined

75) tan 2π 75) _____

A) 0 B) $\frac{\sqrt{2}}{2}$ C) 1 D) undefined

76) cos π 76) _____

A) 0 B) 1 C) –1 D) undefined

77) tan (37π) 77) _____

A) –1 B) 1 C) 0 D) undefined

78) csc $\frac{\pi}{4}$ 78) _____

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

79) cot 30° 79) _____

A) $\frac{\sqrt{3}}{2}$ B) $\sqrt{3}$ C) 1 D) $\frac{\sqrt{3}}{3}$

80) sin 60° 80) _____

A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{3}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$

81) $\tan \frac{\pi}{3}$ 81) _____

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

Find the exact value of the expression. Do not use a calculator.

82) $\sin \frac{\pi}{3} - \cos \frac{\pi}{6}$ 82) _____

A) 0 B) 1 C) $\frac{\sqrt{3} - 1}{2}$ D) $\sqrt{3}$

Find the exact value. Do not use a calculator.

83) $\cos \frac{20\pi}{3}$ 83) _____

A) $-\frac{\sqrt{3}}{2}$ B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$

Find the exact value of the expression. Do not use a calculator.

84) $\cos 120° \tan 60°$ 84) _____

A) $\frac{\sqrt{3}}{2}$ B) $\frac{3}{2}$ C) $-\frac{1}{4}$ D) $-\frac{\sqrt{3}}{2}$

A point on the terminal side of an angle θ is given. Find the exact value of the indicated trigonometric function of θ.

85) (12, 5) Find $\sin \theta$. 85) _____

A) $-\frac{5}{13}$ B) $\frac{12}{13}$ C) $\frac{5}{13}$ D) $-\frac{12}{13}$

86) (–5, –1) Find $\sec \theta$. 86) _____

A) $-\sqrt{26}$ B) $-\frac{\sqrt{26}}{5}$ C) $-\frac{3\sqrt{26}}{26}$ D) $\frac{\sqrt{26}}{5}$

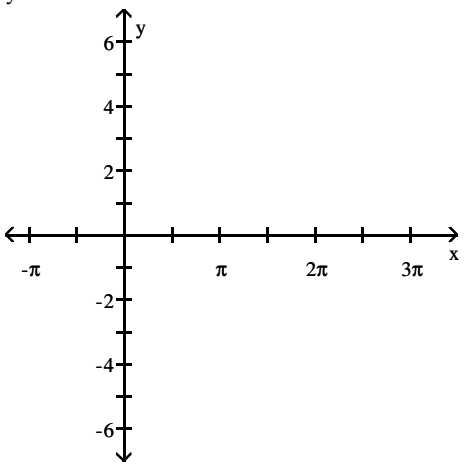
Solve the problem.

87) If $\sin \theta = 0.3$, find $\sin (\theta + \pi)$. 87) _____

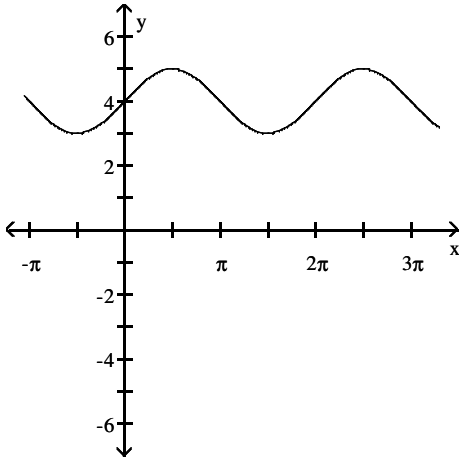
A) –0.3 B) 0.3 C) –0.7 D) 0.7

Use transformations to graph the function.

88) $y = 4 \sin x$ 88) _____



A)



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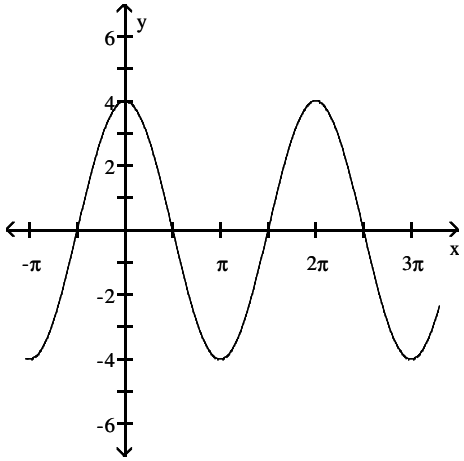
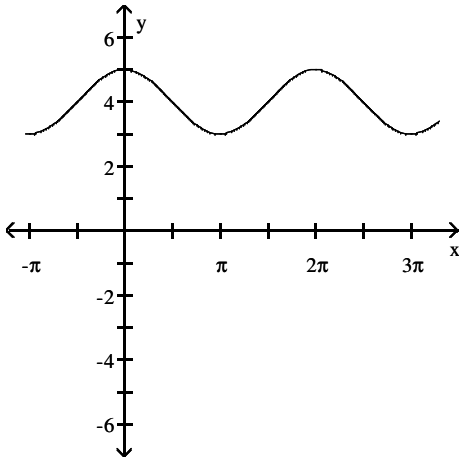
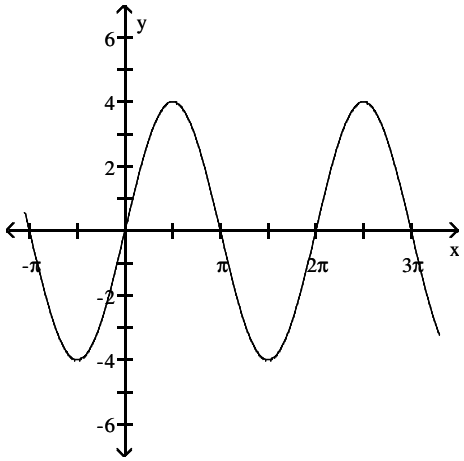


C)



D)



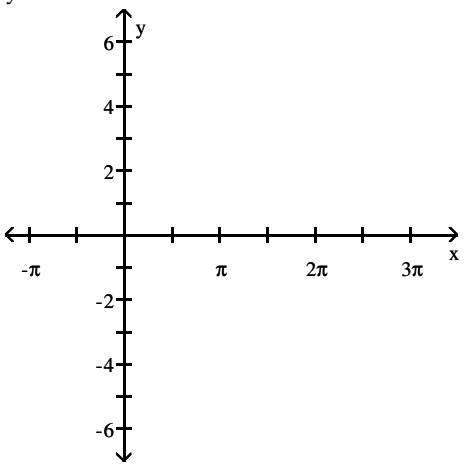
Solve the problem.

89) For what numbers x, $0 \le x \le 2\pi$, does $\sin x = 0$? 89) _____

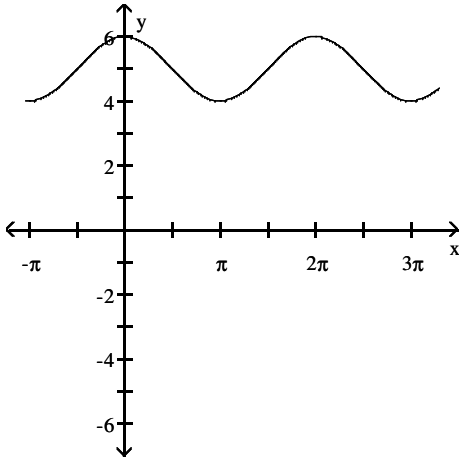
A) $\frac{\pi}{2}, \frac{3\pi}{2}$ B) 0, π, 2π C) 0, 1 D) 0, 1, 2

Use transformations to graph the function.

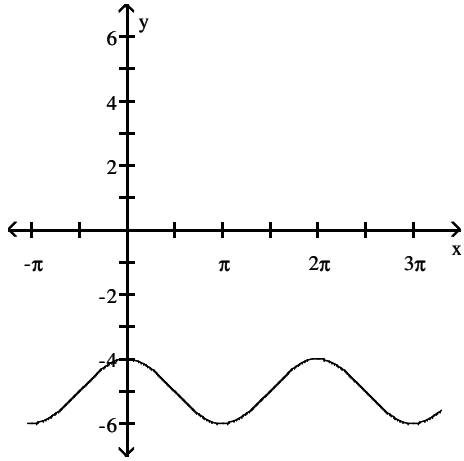
90) $y = \cos x - 5$ 90) _____



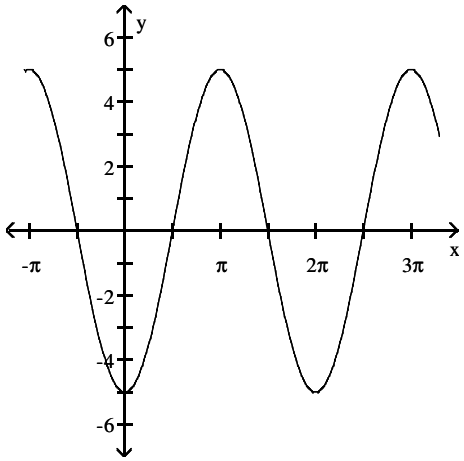
A)



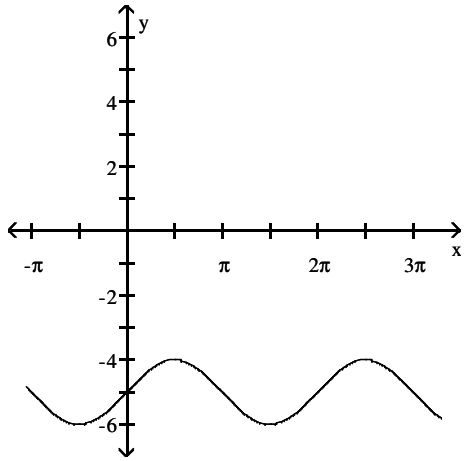
B)



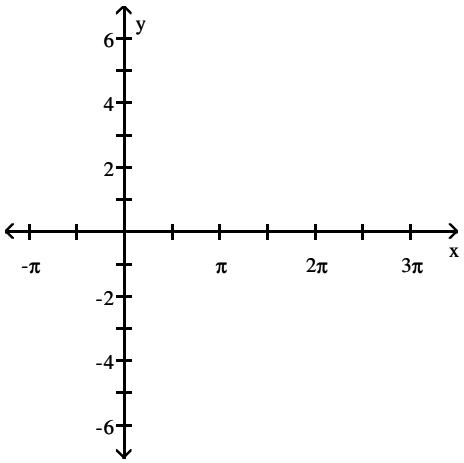
C)



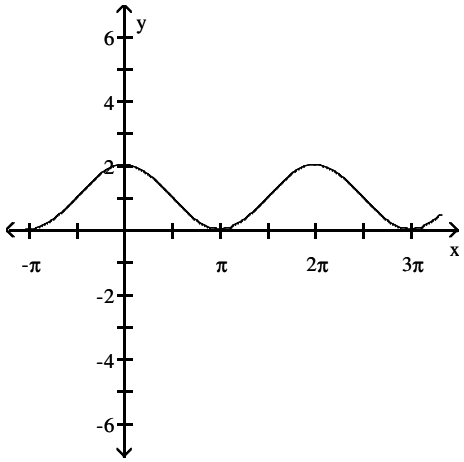
D)



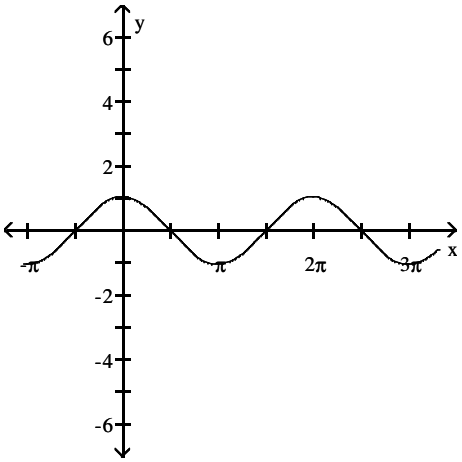
91) $y = \cos\left(\frac{\pi}{3}x\right)$ 91) _____



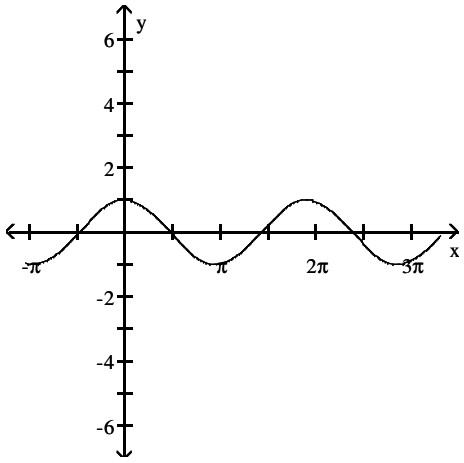
A)



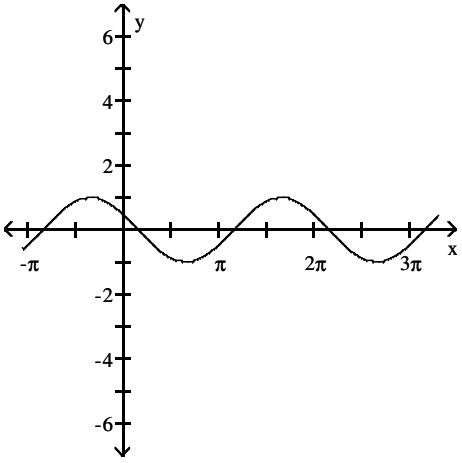
B)



C)



D)



Solve the problem.

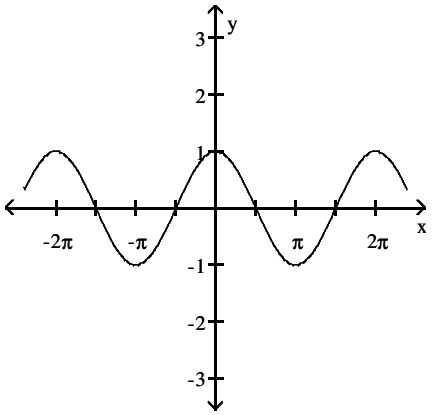
92) For what numbers x, $0 \le x \le 2\pi$, does $\cos x = -1$? 92) _____

A) $\frac{\pi}{2}, \frac{3\pi}{2}$ B) π C) $\frac{\pi}{2}$ D) none

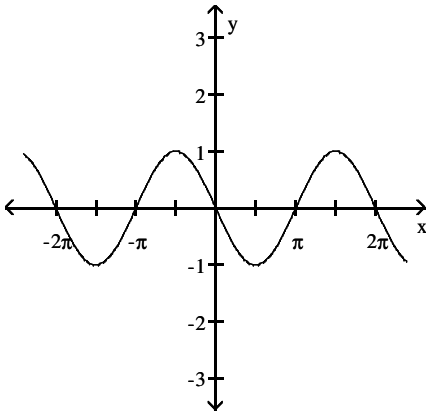
Match the given function to its graph.

93) 1) $y = \sin x$ 2) $y = \cos x$ 3) $y = -\sin x$ 4) $y = -\cos x$ 93) _____

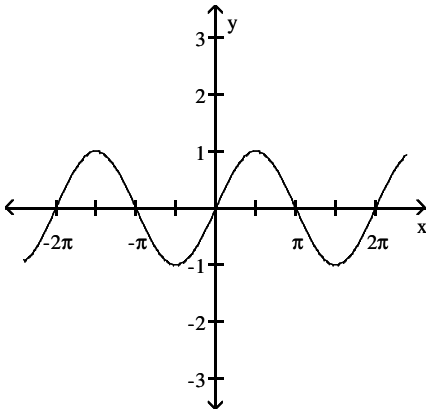
A



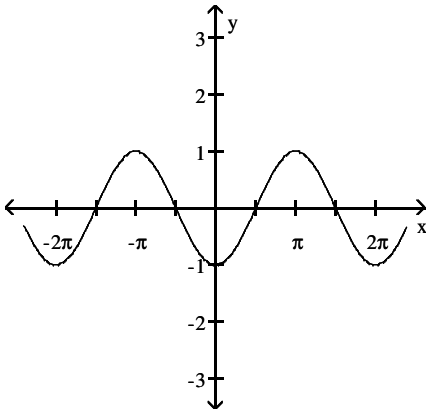
B



C



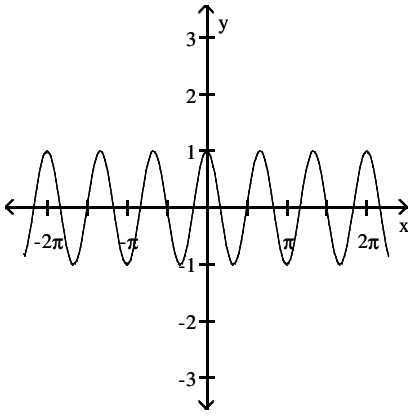
D



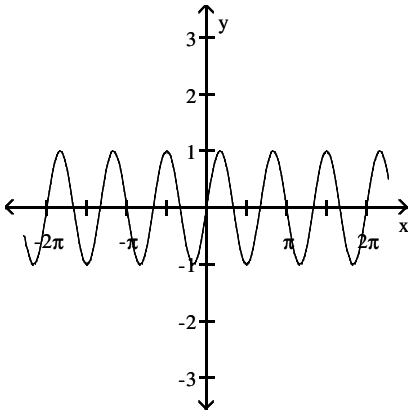
A) 1C, 2A, 3B, 4D B) 1B, 2D, 3C, 4A C) 1A, 2D, 3C, 4B D) 1A, 2B, 3C, 4D

94) 1) $y = \sin 3x$ 2) $y = 3 \cos x$ 94) _____
3) $y = 3 \sin x$ 4) $y = \cos 3x$

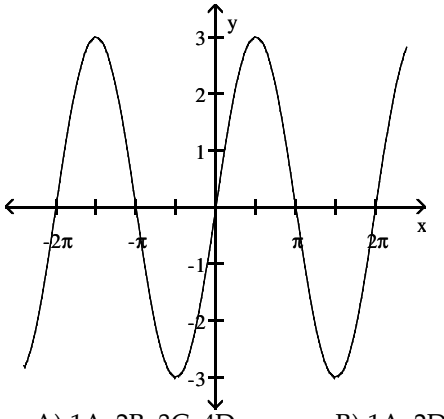
A



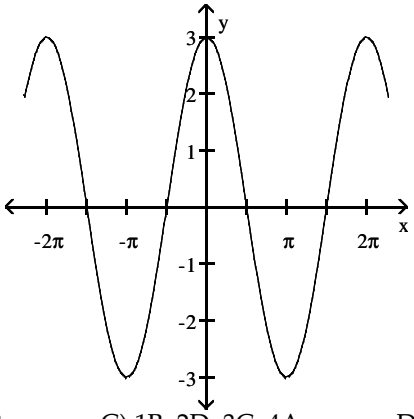
B



C



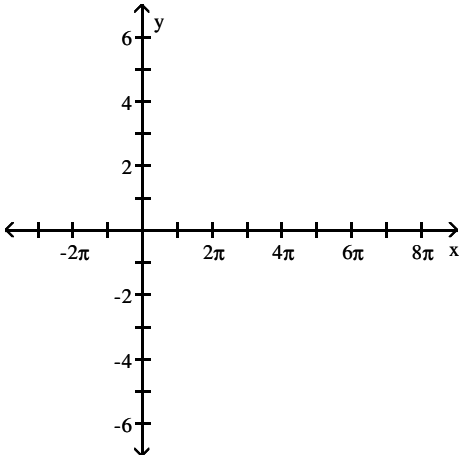
D



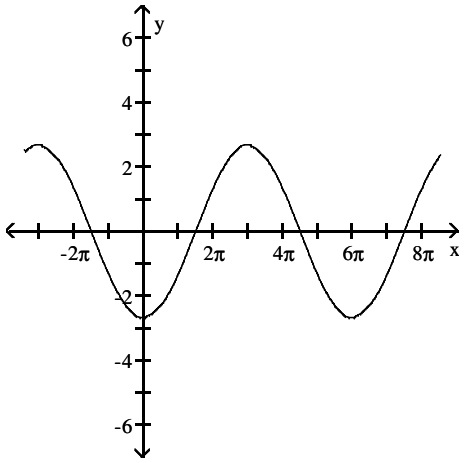
A) 1A, 2B, 3C, 4D B) 1A, 2D, 3C, 4B C) 1B, 2D, 3C, 4A D) 1A, 2C, 3D, 4B

Graph the sinusoidal function.

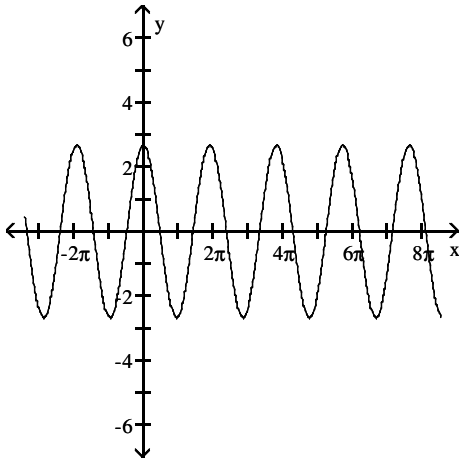
95) $y = \frac{8}{3} \cos\left(-\frac{1}{3}x\right)$ 95) _____



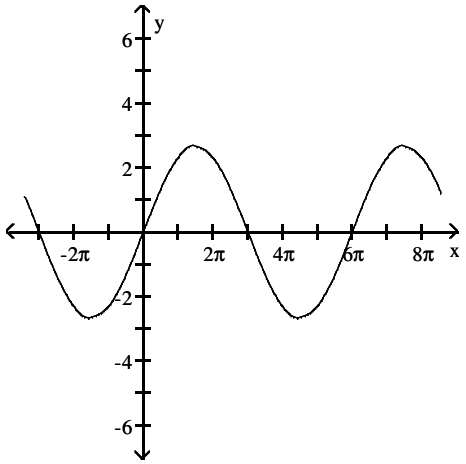
A)



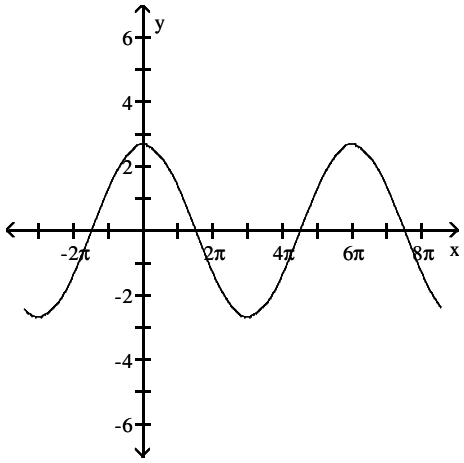
B)



C)

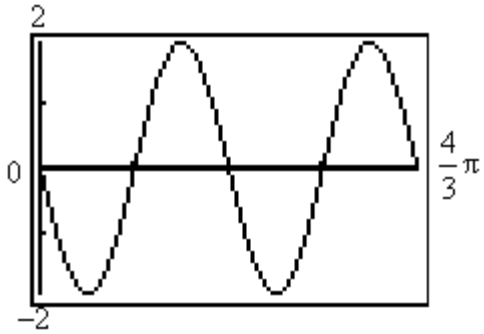


D)



Answer the question.

96) Which one of the equations below matches the graph? 96) _____



A) $y = -2\sin(3x)$ B) $y = -2\cos(3x)$ C) $y = 2\sin\left(\frac{1}{3}x\right)$ D) $y = -2\sin\left(\frac{1}{3}x\right)$

Write the equation of a sine function that has the given characteristics.

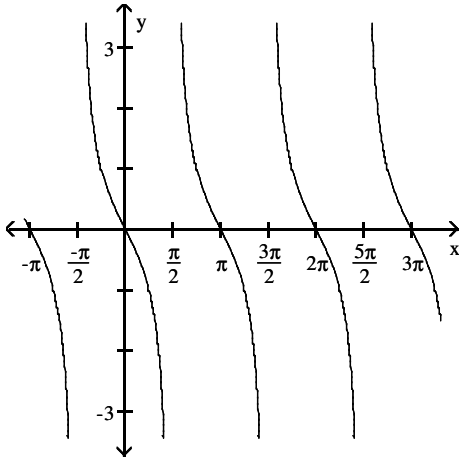
97) Amplitude: 5 97) _____
Period: 4π

A) $y = 4\sin\left(\frac{2}{5}x\right)$ B) $y = 5\sin\left(\frac{1}{2}x\right)$ C) $y = 5\sin(4x)$ D) $y = \sin(4x) + 5$

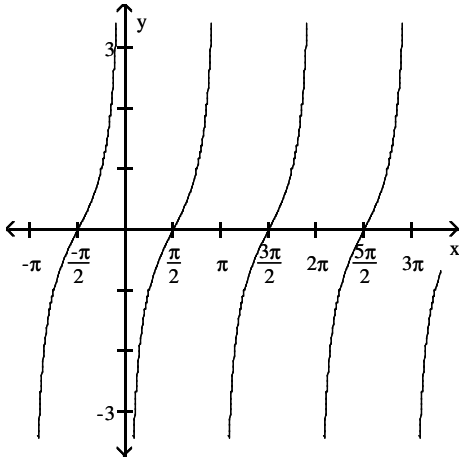
Match the function to its graph.

98) $y = -\tan x$ 98) _____

A)



B)



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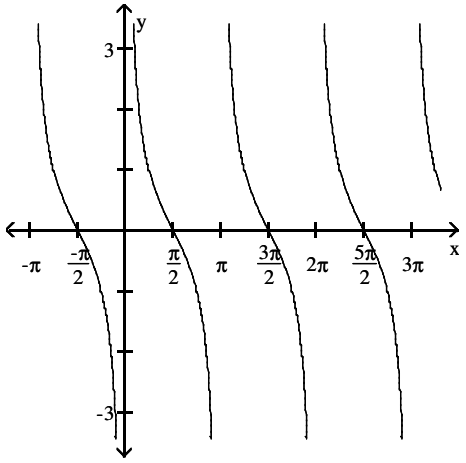
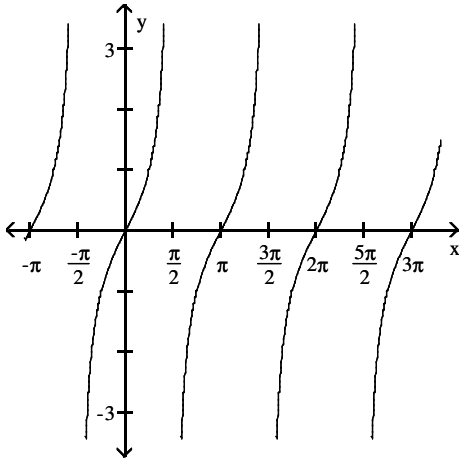
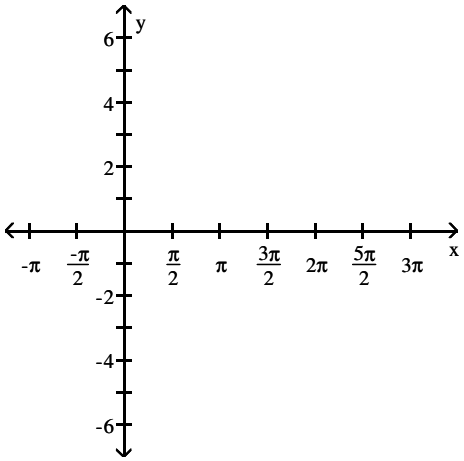


D)

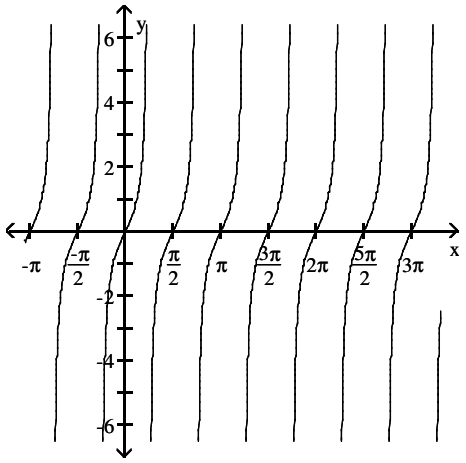


Graph the function.

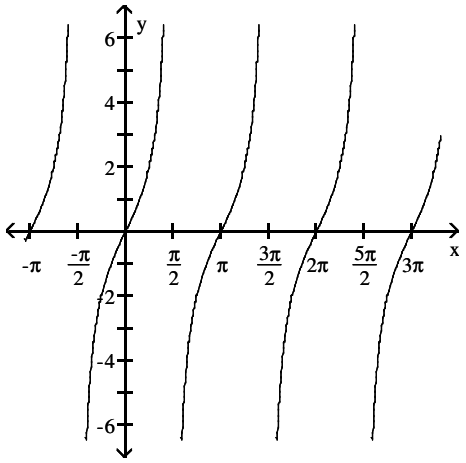
99) $y = \cot(2x)$ 99) _____



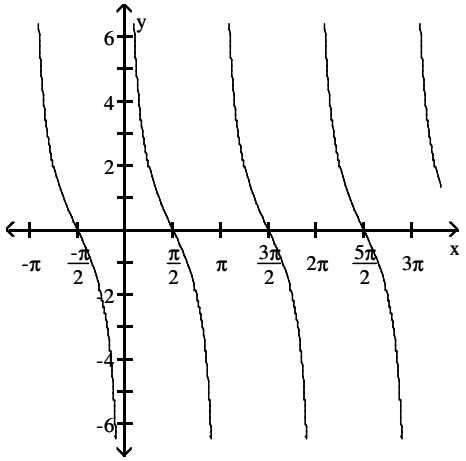
A)



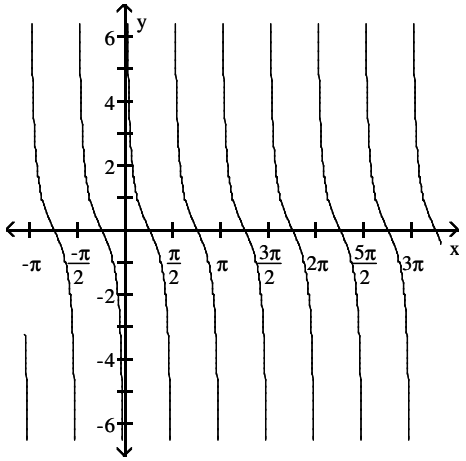
B)



C)



D)



Solve the problem.

100) For what numbers x, $-2\pi \le x \le 2\pi$, does the graph of y = tan x have vertical asymptotes.? 100) _____

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

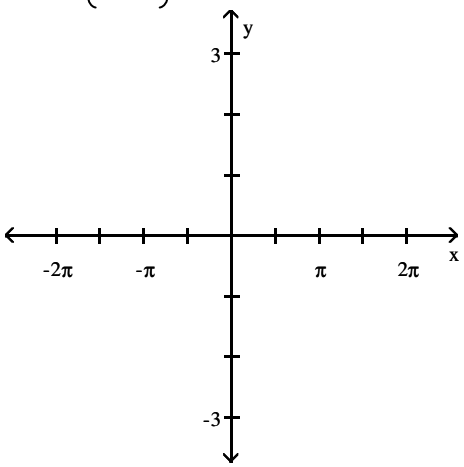
B) –2, –1, 0, 1, 2

C) $-2\pi, -\pi, 0, \pi, 2\pi$

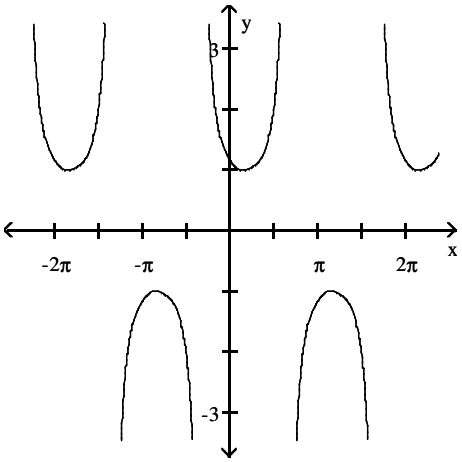
D) none

Graph the function.

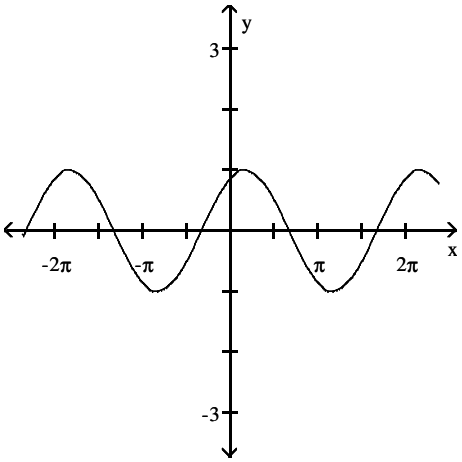
101) $y = \csc\left(x + \frac{\pi}{3}\right)$ 101) _____



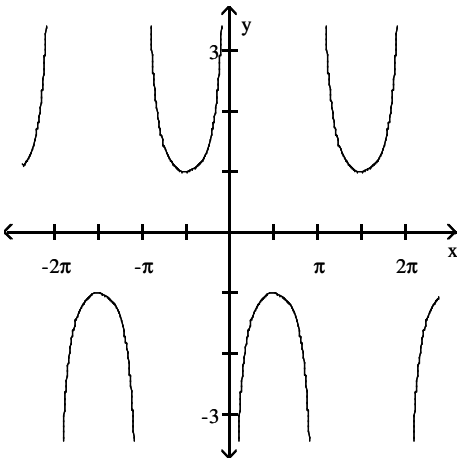
A)



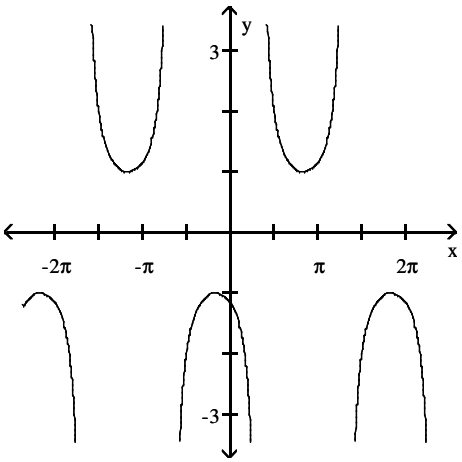
B)



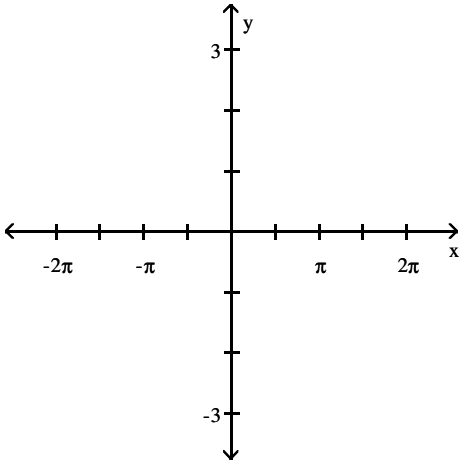
C)



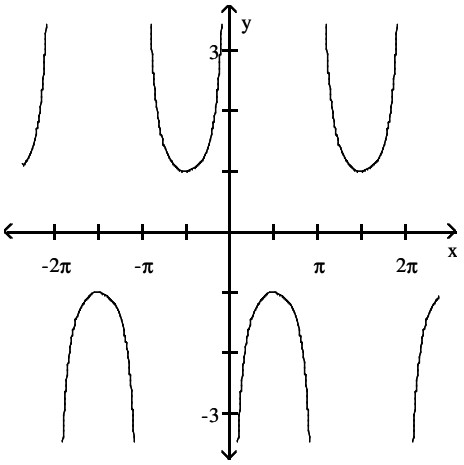
D)



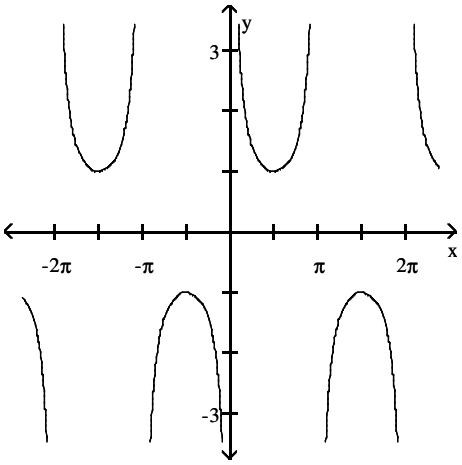
102) $y = -\sec x$ 102) _____



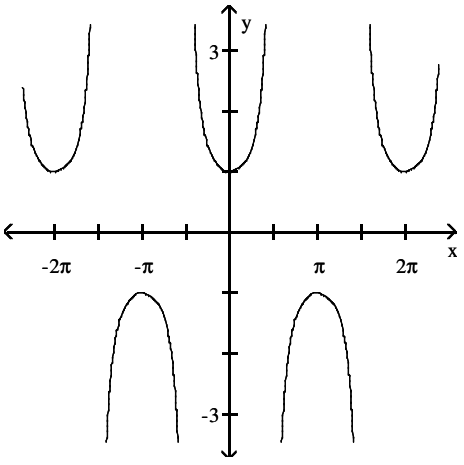
A)



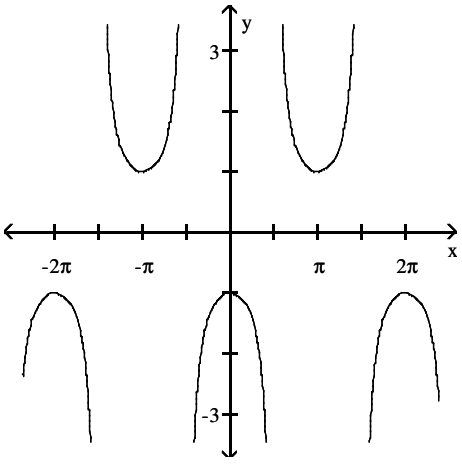
B)



C)



D)



Solve the equation on the interval $0 \le \theta < 2\pi$.

103) $\sin(4\theta) = \frac{\sqrt{3}}{2}$ 103) _____

A) $0, \frac{\pi}{4}, \pi$

B) 0

C) $\frac{\pi}{12}, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{12}, \frac{7\pi}{6}, \frac{13\pi}{12}, \frac{5\pi}{3}, \frac{19\pi}{12}$

D) $\frac{\pi}{4}, \frac{5\pi}{4}$

104) $2\cos\theta + 1 = 0$ 104) _____

A) $\frac{\pi}{3}, \frac{5\pi}{3}$ B) $\frac{2\pi}{3}, \frac{4\pi}{3}$ C) $\frac{3\pi}{2}$ D) $\frac{\pi}{2}, \frac{3\pi}{2}$

105) $\cot\left(2\theta - \frac{\pi}{2}\right) = 1$ 105) _____

A) $\frac{3\pi}{8}, \frac{7\pi}{8}$ B) $\frac{3\pi}{8}, \frac{7\pi}{8}, \frac{11\pi}{8}$, and $\frac{15\pi}{8}$

C) $\frac{\pi}{4}, \frac{5\pi}{4}, \frac{9\pi}{4}$, and $\frac{13\pi}{4}$ D) $\frac{3\pi}{8}$

Solve the equation. Give a general formula for all the solutions.

106) $\sin\theta = \frac{\sqrt{3}}{2}$ 106) _____

A) $\theta = \frac{\pi}{6} + k\pi, \theta = \frac{5\pi}{6} + k\pi$ B) $\theta = \frac{\pi}{3} + 2k\pi, \theta = \frac{2\pi}{3} + 2k\pi$

C) $\theta = \frac{\pi}{6} + 2k\pi, \theta = \frac{5\pi}{6} + 2k\pi$ D) $\theta = \frac{\pi}{3} + k\pi, \theta = \frac{2\pi}{3} + k\pi$

107) $\cos(2\theta) = \frac{\sqrt{2}}{2}$ 107) _____

A) $\theta = \frac{\pi}{4} + k\pi, \theta = \frac{3\pi}{4} + k\pi$ B) $\theta = \frac{\pi}{8} + 2k\pi, \theta = \frac{7\pi}{8} + 2k\pi$

C) $\theta = \frac{2\pi}{3} + k\pi, \theta = \frac{4\pi}{3} + k\pi$ D) $\theta = \frac{\pi}{8} + k\pi, \theta = \frac{7\pi}{8} + k\pi$

Solve the equation on the interval $[0, 2\pi)$.

108) Suppose $f(x) = 4\csc\theta - 3$. Solve $f(x) = 1$. 108) _____

A) 2π B) $\frac{3\pi}{2}$ C) π D) $\frac{\pi}{2}$

Solve the equation on the interval $0 \le \theta < 2\pi$.

109) $\cos^2\theta + 2\cos\theta + 1 = 0$ 109) _____

A) $\frac{\pi}{2}, \frac{3\pi}{2}$ B) $\frac{\pi}{4}, \frac{7\pi}{4}$ C) π D) 2π

110) $\csc^5\theta - 4\csc\theta = 0$ 110) _____

A) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{3}, \frac{5\pi}{6}$ B) $\frac{\pi}{4}, \frac{5\pi}{4}, \frac{\pi}{3}, \frac{5\pi}{3}$ C) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$ D) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{6}, \frac{5\pi}{6}$

111) $\tan\theta + \sec\theta = 1$ 111) _____

A) 0 B) $\frac{5\pi}{4}$ C) $\frac{\pi}{4}$ D) No solution

112) $\sec^2\theta - 2 = \tan^2\theta$ 112) _____

A) $\frac{\pi}{4}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$ D) No solution

113) $\sin^2\theta - \cos^2\theta = 0$ 113) _____

A) $\frac{\pi}{4}$ B) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$ C) $\frac{\pi}{4}, \frac{\pi}{3}$ D) $\frac{\pi}{4}, \frac{\pi}{6}$

114) $\cos(2\theta) = \sqrt{2} - \cos(2\theta)$ 114) _____

A) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$ B) $\frac{\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{15\pi}{8}$

C) $0, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}$ D) No solution

Solve the problem.

115) A new homeowner has a triangular–shaped back yard. Two of the three sides measure 65 ft and 80 ft and form an included angle of 125°. The owner wants to approximate the area of the yard, so that he can determine the amount of fertilizer and grass seed to be purchased. Find the area of the yard rounded to the nearest square foot. 115) _____

A) 4260 sq. ft B) 5200 sq. ft C) 2129 sq. ft D) 2130 sq. ft

116) Find the area of the Bermuda Triangle if the sides of the triangle have the approximate lengths 842 miles, 925 miles, and 1310 miles. 116) _____

A) 387,579 mi B) 1,550,314 mi C) 513,285 mi D) 490,934 mi

Perform the indicated operation.

117) $\frac{3x + 8y}{x^2 + 8xy + 16y^2} \cdot \frac{x + 4y}{4}$ 117) _____

A) $\frac{3x^2 + 32xy + 32y^2}{4x^2 + 32xy + 64y^2}$ B) $\frac{3x^2 + 32xy}{4x^2 + 32xy + 64y^2}$

C) $\frac{3x + 8y}{4(x + 4y)}$ D) $\frac{5}{32xy}$

118) $\frac{3x^2 - 16x + 21}{x^2 - 9} \cdot \frac{x^2 + 3}{3x^2 + 2x - 21}$ 118) _____

A) $\frac{x^2 + 3}{(x + 3)(x + 3)}$ B) $\frac{x^2 + 3}{2x + 6}$ C) $\frac{x^2 - 3}{(x + 3)(x - 3)}$ D) $-\frac{x^2 + 3}{(x + 3)(x + 3)}$

119) $\dfrac{\dfrac{x^3}{x^2 - 4}}{\dfrac{x^3 - 9x^2}{x^2 + 7x - 18}}$ 119) _____

A) $\dfrac{x(x + 9)}{(x + 2)(x - 9)}$ B) $\dfrac{x(x - 9)}{(x + 2)(x + 9)}$

C) $-\dfrac{x(x + 9)}{(x + 2)(x - 9)}$ D) $\dfrac{x^5(x - 9)}{(x + 2)(x + 9)(x - 2)^2}$

Simplify the complex rational expression using either Method I or Method II.

120) $\dfrac{\dfrac{7}{x + 3} - \dfrac{7}{x - 3}}{\dfrac{5}{x^2 - 9}}$ 120) _____

A) $\dfrac{2x}{5}$ B) $-\dfrac{42}{5}$ C) $\dfrac{42}{5}(x - 3)$ D) 0

Solve the equation and state the solution set.

121) $\dfrac{6}{x + 1} = \dfrac{2}{x - 1}$ 121) _____

A) $\{-2\}$ B) $\{2\}$ C) $\left\{\dfrac{1}{2}\right\}$ D) $\left\{\dfrac{1}{4}\right\}$

122) $\dfrac{1}{x + 7} + \dfrac{4}{x + 5} = \dfrac{-2}{x^2 + 12x + 35}$ 122) _____

A) {0} B) {−7} C) {5} D) { } or ∅

1) D
2) B
3) C
4) B
5) C
6) D
7) C
8) D
9) C
10) A
11) A
12) C
13) B
14) C
15) B
16) C
17) C
18) C
19) C
20) B
21) A
22) B
23) D
24) A
25) A
26) A
27) C
28) $27.50
$32.50;
$C(x) = \begin{cases} 20 & \text{if } 0 \le x \le 100 \\ 12.5 + 0.075x & \text{if } 100 < x \le 200 \\ 7.5 + 0.1x & \text{if } x > 200 \end{cases}$
29) B
30) C
31) C
32) D
33) B
34) C
35) D
36) C
37) B
38) D
39) C
40) $A(x) = \frac{1}{2}x^3$
41) B
42) D
43) D
44) A
45) C

46) B
47) B
48) A
49) C
50) C
51) A
52) B
53) B
54) C
55) D
56) A
57) A
58) A
59) A
60) B
61) C
62) C
63) C
64) C
65) C
66) B
67) C
68) D
69) C
70) D
71) A
72) C
73) D
74) C
75) A
76) C
77) C
78) C
79) B
80) C
81) A
82) A
83) C
84) D
85) C
86) B
87) A
88) D
89) B
90) B
91) C
92) B
93) A
94) C
95) D

96) A
97) B
98) A
99) D
100) A
101) A
102) D
103) C
104) B
105) B
106) B
107) D
108) D
109) C
110) C
111) A
112) D
113) B
114) B
115) D
116) A
117) C
118) A
119) A
120) B
121) B
122) D