

Exam

Name _____

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

Use a graphing calculator or computer to determine which of the given viewing windows displays the most appropriate graph of the specified function.

- 1) $f(x) = 11 + 6x - x^3$ 1) _____
A) [-10, 20] by [-50, 50] B) [-4, 5] by [-15, 25]
C) [-10, 10] by [-10, 5] D) [-4, 5] by [-5, 5]

Answer: B
Explanation: A)
B)
C)
D)

- 2) $f(x) = |x^2 - 6|$ 2) _____
A) [-5, 5] by [-15, 15] B) [0, 5] by [-2, 10]
C) [-5, 5] by [-2, 10] D) [-10, 10] by [-15, 15]

Answer: C
Explanation: A)
B)
C)
D)

- 3) $f(x) = x^2 + \frac{1}{10} \cos 70x$ 3) _____
A) [-0.6, 0.6] by [-0.1, 0.6] B) [-0.1, 0.1] by [-0.1, 0.1]
C) [-10, 10] by [-10, 10] D) [-2, 2] by [-1, 1]

Answer: A
Explanation: A)
B)
C)
D)

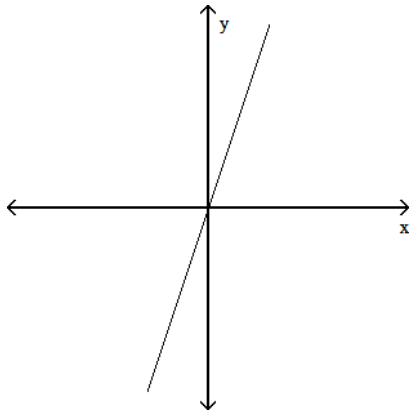
- 4) $f(x) = \sqrt{7 + 6x - x^2}$ 4) _____
A) [-10, 10] by [-10, 5] B) [-10, 20] by [-50, 50]
C) [-4, 5] by [-5, 5] D) [-4, 5] by [-15, 25]

Answer: D
Explanation: A)
B)
C)
D)

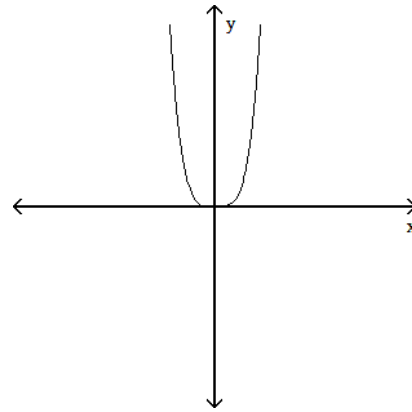
Match the equation with its graph.

5) $y = 3^x$

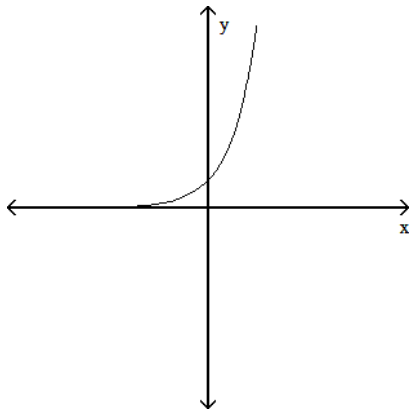
A)



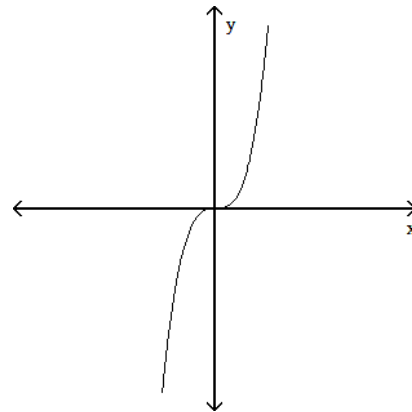
B)



C)



D)



5) _____

Answer: C

Explanation: A)
B)
C)
D)

Use a graphing calculator or computer to determine which of the given viewing windows displays the most appropriate graph of the specified function.

6) $f(x) = x^4 - 9x^2 + 6x$

A) $[-10, 15]$ by $[-5, 5]$

C) $[-25, 15]$ by $[-5, 5]$

B) $[-5, 5]$ by $[-10, 15]$

D) $[-5, 5]$ by $[-25, 15]$

6) _____

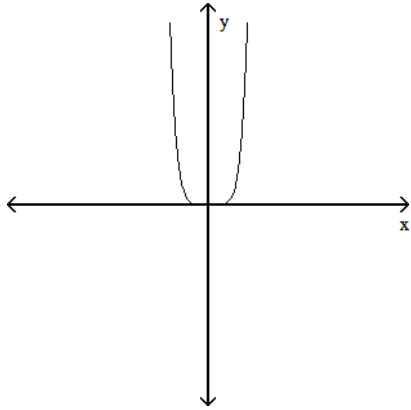
Answer: D

Explanation: A)
B)
C)
D)

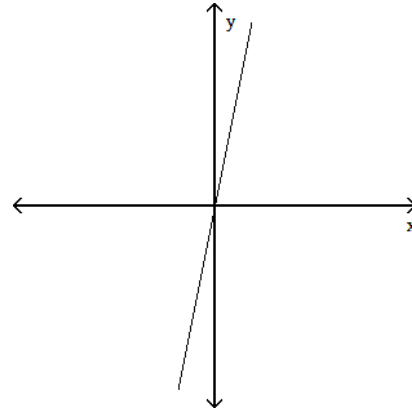
Match the equation with its graph.

7) $y = x^5$

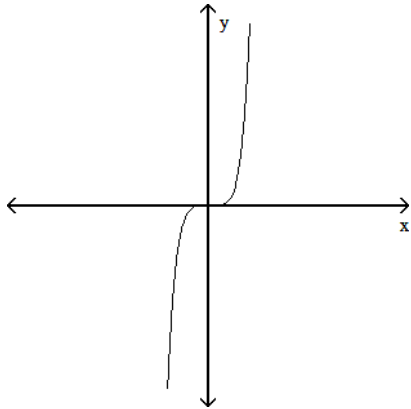
A)



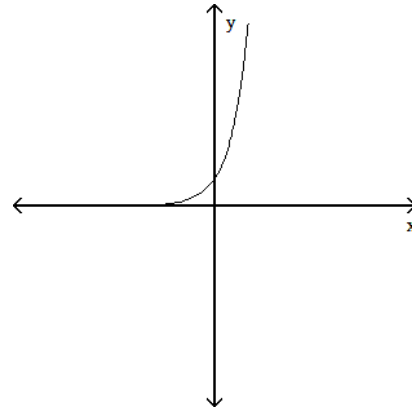
B)



C)



D)



7) _____

Answer: C

Explanation: A)
B)
C)
D)

Use a graphing calculator or computer to determine which of the given viewing windows displays the most appropriate graph of the specified function.

8) $f(x) = x^3 - 2x^2 - 3x + 17$

A) $[-20, 20]$ by $[-100, 100]$

B) $[-5, 25]$ by $[-5, 5]$

C) $[-2, 2]$ by $[-10, 10]$

D) $[-5, 5]$ by $[-5, 25]$

8) _____

Answer: D

Explanation: A)
B)
C)
D)

- 9) $f(x) = 3 \cos 60x$
A) $[-10, 10]$ by $[-10, 10]$
C) $[-1, 1]$ by $[-4, 4]$

Answer: B

Explanation: A)
B)
C)
D)

- B) $[-0.2, 0.2]$ by $[-4, 4]$
D) $[-0.2, 0.2]$ by $[-1, 1]$

9) _____

- 10) $f(x) = x^{2/3}(7 - x)$
A) $[-2, 2]$ by $[-15, 15]$
C) $[-4, 0]$ by $[-5, 5]$

Answer: B

Explanation: A)
B)
C)
D)

- B) $[-4, 10]$ by $[-10, 10]$
D) $[0, 10]$ by $[-10, 10]$

10) _____

11) $f(x) = \frac{x^2 - 1}{x^2 + 1}$

- A) $[-5, 5]$ by $[-15, 15]$
C) $[-10, 10]$ by $[-2, 2]$

Answer: C

Explanation: A)
B)
C)
D)

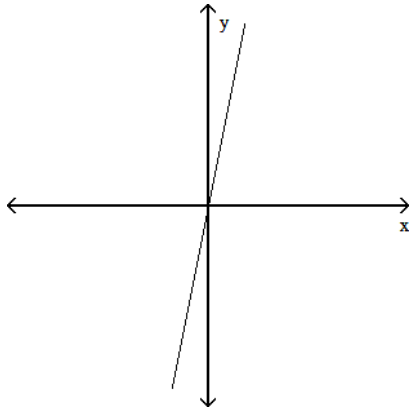
- B) $[-10, 10]$ by $[-10, 10]$
D) $[-1, 1]$ by $[-2, 2]$

11) _____

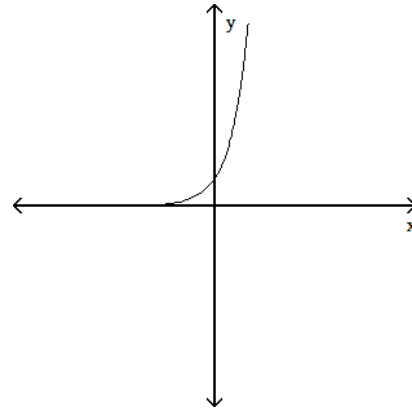
Match the equation with its graph.

12) $y = 5x$

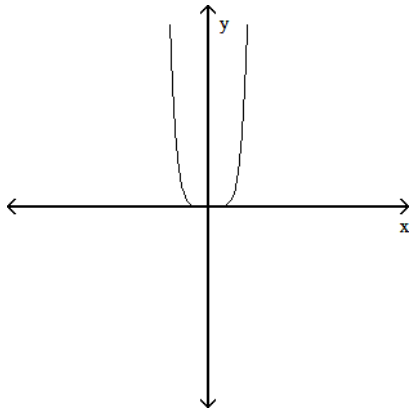
A)



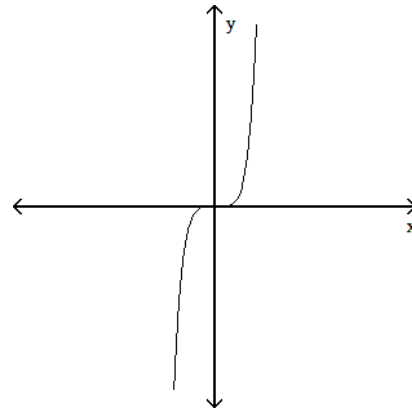
B)



C)



D)



12) _____

Answer: A

Explanation: A)
B)
C)
D)

Use a graphing calculator or computer to determine which of the given viewing windows displays the most appropriate graph of the specified function.

13) $f(x) = \frac{10}{x^2 - 6}$

A) $[-5, 5]$ by $[-10, 10]$

C) $[-2, 2]$ by $[-10, 10]$

B) $[-5, 0]$ by $[-10, 10]$

D) $[0, 5]$ by $[-10, 10]$

13) _____

Answer: A

Explanation: A)
B)
C)
D)

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

Solve the problem.

- 14) What happens if you set $B = -2\pi$ in the angle sum formulas for the sine and cosine functions? Do the results agree with something you already know? 14) _____

Answer: If $B = -2\pi$, then $\cos(A + B) = \cos A$ and $\sin(A + B) = \sin A$. Because the period of both of the sine and cosine functions is 2π , if B is replaced by a multiple of 2π the angle sum formulas must produce the same value as the sine or cosine function.

Explanation:

Provide an appropriate response.

- 15) Derive the identity $\sec^{-1}(-x) = \pi - \sec^{-1} x$ by combining the following two equations: 15) _____

$$\cos^{-1}(-x) = \pi - \cos^{-1} x$$

$$\sec^{-1} x = \cos^{-1}(1/x)$$

Answer: $\sec^{-1}(-x) = \cos^{-1}(-1/x) = \pi - \cos^{-1}(1/x) = \pi - \sec^{-1} x$

Explanation:

Use the addition formulas to derive the identity.

- 16) $\sin\left(x - \frac{\pi}{2}\right) = -\cos x$ 16) _____

Answer:
$$\begin{aligned}\sin\left(x - \frac{\pi}{2}\right) &= \sin x \cos\left(-\frac{\pi}{2}\right) + \cos x \sin\left(-\frac{\pi}{2}\right) \\ &= \sin x (0) + \cos x (-1) \\ &= 0 - \cos x \\ &= -\cos x\end{aligned}$$

Explanation:

- 17) $\cos\left(x + \frac{\pi}{2}\right) = -\sin x$ 17) _____

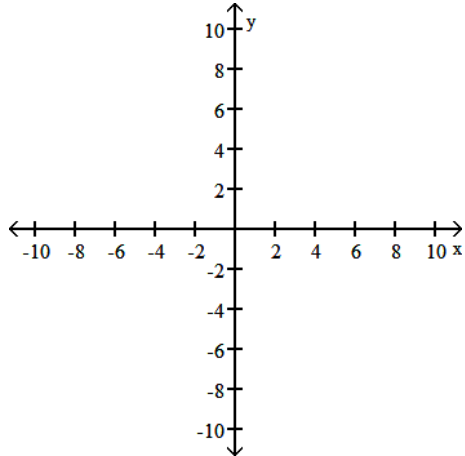
Answer:
$$\begin{aligned}\cos\left(x + \frac{\pi}{2}\right) &= \cos x \cos\frac{\pi}{2} - \sin x \sin\frac{\pi}{2} \\ &= \cos x (0) - \sin x (1) \\ &= 0 - \sin x \\ &= -\sin x\end{aligned}$$

Explanation:

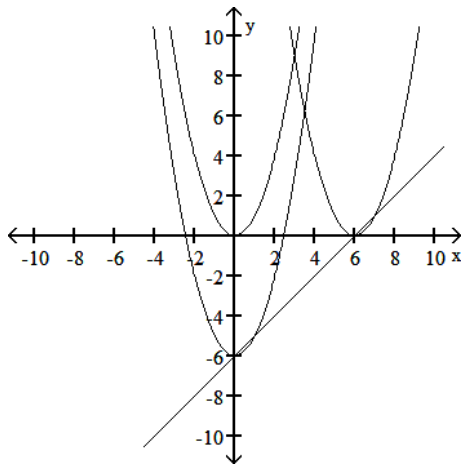
Solve the problem.

18) Let $f(x) = x - 6$ and $g(x) = x^2$. Graph f and g together with $f \circ g$ and $g \circ f$.

18) _____



Answer:



Explanation:

Use the addition formulas to derive the identity.

19) $\cos\left(x - \frac{\pi}{2}\right) = \sin x$

19) _____

$$\begin{aligned} \text{Answer: } \cos\left(x - \frac{\pi}{2}\right) &= \cos x \cos\left(-\frac{\pi}{2}\right) - \sin x \sin\left(-\frac{\pi}{2}\right) \\ &= \cos x (0) - \sin x (-1) \\ &= 0 + \sin x \\ &= \sin x \end{aligned}$$

Explanation:

Solve the problem.

20) The standard formula for the tangent of the difference of two angles is

20) _____

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}. \text{ Derive the formula.}$$

$$\text{Answer: } \tan(A - B) = \frac{\sin(A - B)}{\cos(A - B)} = \frac{\sin A \cos B - \sin B \cos A}{\cos A \cos B + \sin A \sin B} =$$

$$\frac{(\cos A \cos B)^{-1}(\sin A \cos B - \sin B \cos A)}{(\cos A \cos B)^{-1}(\cos A \cos B + \sin A \sin B)} = \frac{\tan A - \tan B}{1 + \tan A \tan B}.$$

Explanation:

Use the addition formulas to derive the identity.

$$21) \sin\left(x + \frac{\pi}{2}\right) = \cos x$$

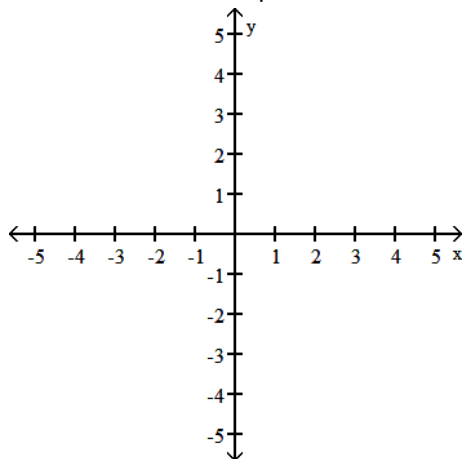
21) _____

$$\begin{aligned} \text{Answer: } \sin\left(x + \frac{\pi}{2}\right) &= \sin x \cos \frac{\pi}{2} + \cos x \sin \frac{\pi}{2} \\ &= \sin x (0) + \cos x (1) \\ &= 0 + \cos x \\ &= \cos x \end{aligned}$$

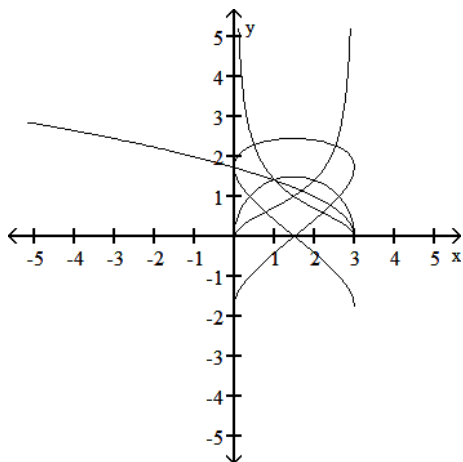
Explanation:

Solve the problem.

- 22) Graph the functions $f(x) = \sqrt{x}$ and $g(x) = \sqrt{3-x}$ together with their sum, product, two differences, and two quotients. 22) _____



Answer:



Explanation:

- 23) Use the angle sum formulas to derive $\sin(A - B) = \sin A \cos B - \cos A \sin B$. 23) _____

Answer: $\sin(A - B)$
 $= \sin(A + (-B))$
 $= \sin A \cos(-B) + \cos A \sin(-B)$
 $= \sin A \cos B - \cos A \sin B$

Explanation:

- 24) Graph $y = \cos 2x$ and $y = \sec 2x$ together for $-\frac{3\pi}{4} \leq x \leq \frac{3\pi}{4}$. Comment on the behavior of 24) _____

$\sec 2x$ in relation to the signs and values of $\cos 2x$.

Answer: When $y = \cos 2x$ is at a maximum point, which is at any multiple of π , $y = \sec 2x$ is a minimum point. Similarly, when $\cos(2x)$ is at a minimum point, which is at any odd multiple of $\frac{\pi}{2}$, $y = \sec 2x$ is at a maximum point.

Explanation:

25) Graph $y = \sin \frac{x}{2}$ and $y = \csc \frac{x}{2}$ together for $-2\pi \leq x \leq 2\pi$. Comment on the behavior of $\csc \frac{x}{2}$ in relation to the signs and values of $\sin \frac{x}{2}$. 25) _____

Answer: When $y = \sin \frac{x}{2}$ is at a maximum point, which is at $x = (4n + 1)\pi$ for all integers n , $y = \csc \frac{x}{2}$ is at a minimum point. Similarly, when $y = \sin \frac{x}{2}$ is at minimum point, which is at $x = (4n - 1)\pi$ for all integers n , $y = \csc \frac{x}{2}$ is at a maximum point.

Explanation:

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

Express as a single logarithm and, if possible, simplify.

26) $\ln(7 \sec \theta) + \ln(7 \cos \theta)$ 26) _____
 A) $\ln(49)$ B) $\ln(49 \cot \theta)$
 C) $\ln(1)$ D) $\ln(7 \sec \theta + 7 \cos \theta)$

Answer: A

Explanation: A)
 B)
 C)
 D)

Provide an appropriate response.

27) If $f(x)$ is one-to-one, is $g(x) = f(-x)$ also one-to-one? Explain. 27) _____
 A) $g(x)$ is a reflection of $f(x)$ across the line $y = x$. It will not be one-to-one.
 B) $g(x)$ is a reflection of $f(x)$ across the y -axis. It will be one-to-one.
 C) There is not enough information to determine whether $g(x)$ is one-to-one.
 D) $g(x)$ is a reflection of $f(x)$ across the x -axis. It will be one-to-one.

Answer: B

Explanation: A)
 B)
 C)
 D)

One of $\sin x$, $\cos x$, and $\tan x$ is given. Find the other two if x lies in the specified interval.

28) $\cos x = -\frac{1}{5}$, x in $\left[\pi, \frac{3\pi}{2}\right]$ 28) _____
 A) $\sin x = \frac{2\sqrt{6}}{5}$, $\tan x = -2\sqrt{6}$ B) $\sin x = -\frac{2\sqrt{6}}{5}$, $\tan x = -2\sqrt{6}$
 C) $\sin x = -\frac{2\sqrt{6}}{5}$, $\tan x = 2\sqrt{6}$ D) $\sin x = \frac{2\sqrt{6}}{5}$, $\tan x = 2\sqrt{6}$

Answer: C

Explanation: A)
 B)
 C)
 D)

Solve for the angle θ , where $0 \leq \theta \leq 2\pi$

29) $\sin^2\theta = \frac{3}{4}$

29) _____

A) $\theta = 0, \pi, 2\pi$

B) $\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

C) $\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

D) $\theta = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

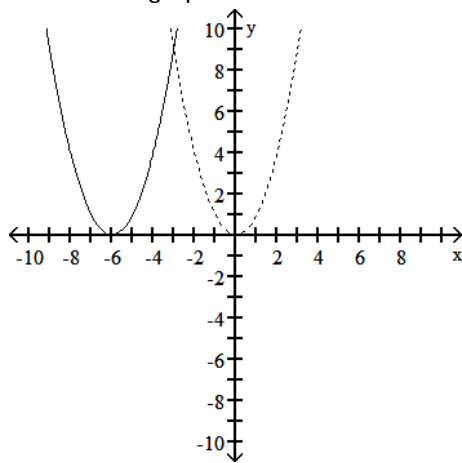
Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

30) The accompanying figure shows the graph of $y = x^2$ shifted to a new position. Write the equation for the new graph.

30) _____



A) $y = x^2 - 6$

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

C) $y = (x - 6)^2$

D) $y = x^2 + 6$

Answer: B

Explanation: A)
B)
C)
D)

31) Suppose the consumption of electricity grows at 8.6% per year, compounded continuously. Find the number of years before the use of electricity has tripled. Round the answer to the nearest hundredth.

31) _____

A) 12.77 yr

B) 0.13 yr

C) 34.88 yr

D) 1.28 yr

Answer: A

Explanation: A)
B)
C)
D)

Use a graph to find an approximate solution to the equation. Round to the nearest thousandth.

32) $4^{3x} = 6^x + 1$

A) 2.292

B) 0.757

C) 1.292

D) -4.419

32) _____

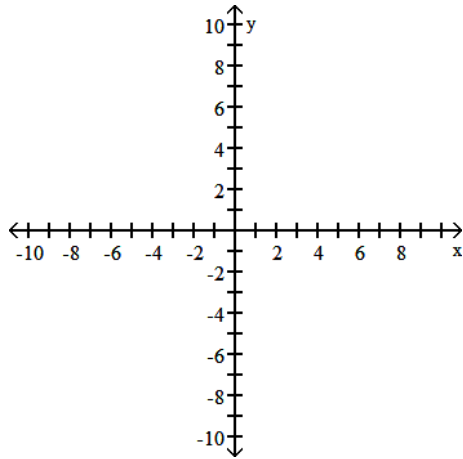
Answer: B

Explanation: A)
B)
C)
D)

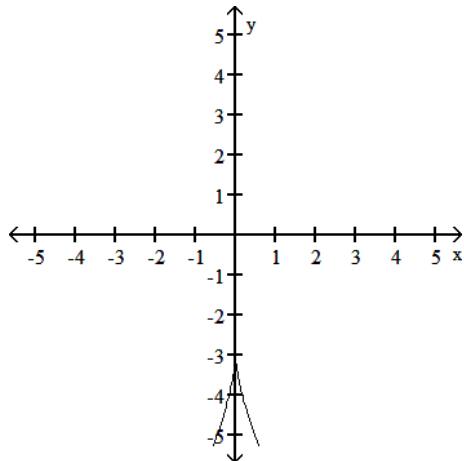
Graph the function.

33) $y = (-6x)^{2/3} - 3$

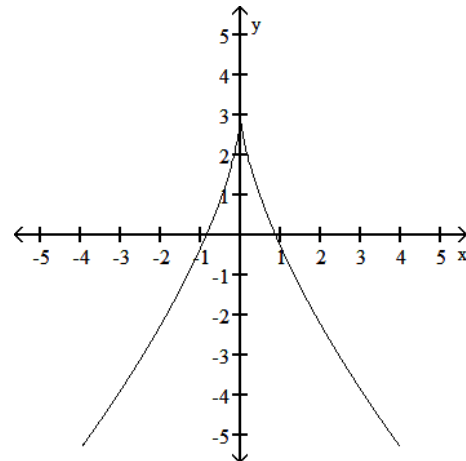
33) _____

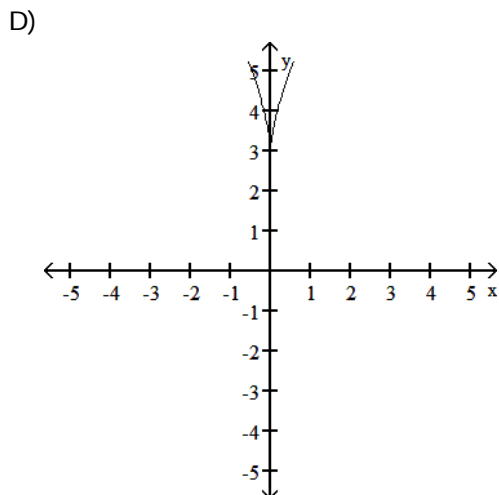
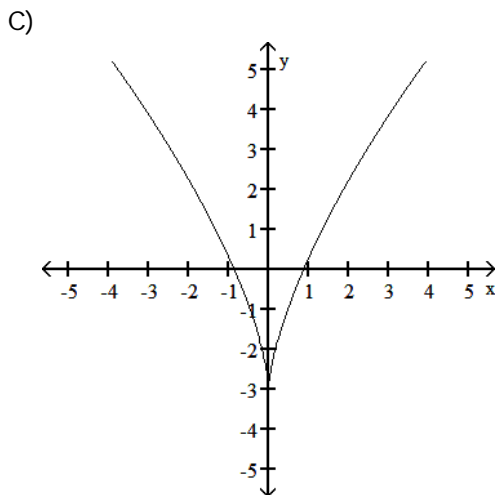


A)



B)





Answer: C
 Explanation: A)
 B)
 C)
 D)

Find the formula for the function.

34) Express the length d of a square's diagonal as a function of its side length x .

- A) $d = 2x$ B) $d = x\sqrt{2}$ C) $d = x$ D) $d = x\sqrt{3}$

34) _____

Answer: B
 Explanation: A)
 B)
 C)
 D)

Find the function value.

35) $\cos^2 \frac{\pi}{12}$

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

35) _____

Answer: A
 Explanation: A)
 B)
 C)
 D)

The problem tells by what factor and direction the graph of the given function is to be stretched or compressed. Give an equation for the stretched or compressed graph.

36) $y = \sqrt{x+1}$ compressed vertically by a factor of 3

36) _____

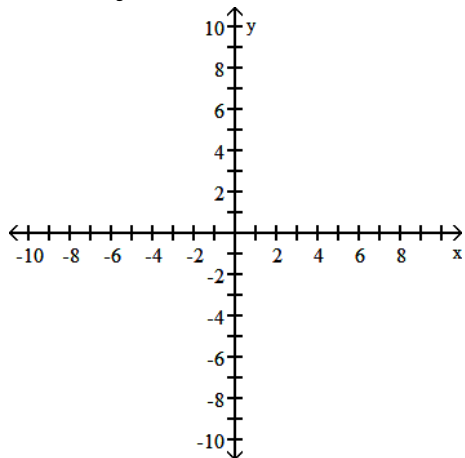
- A) $y = \sqrt{3x+3}$ B) $y = \frac{\sqrt{x+1}}{3}$ C) $y = \sqrt{3x+1}$ D) $y = 3\sqrt{x+1}$

Answer: B
 Explanation: A)
 B)
 C)
 D)

The equation of an ellipse is given. Put the equation in standard form and sketch the ellipse.

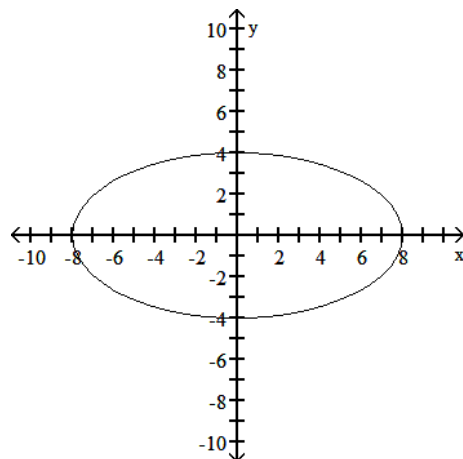
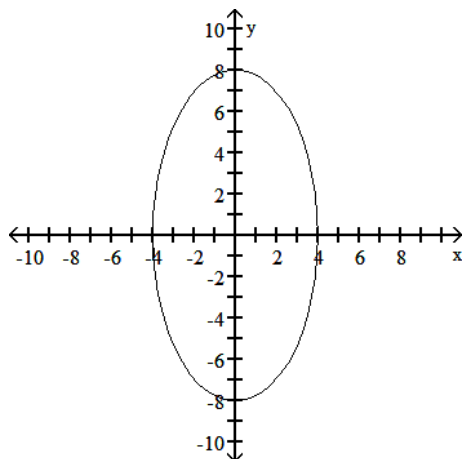
37) $16x^2 + 64y^2 = 1024$

37) _____



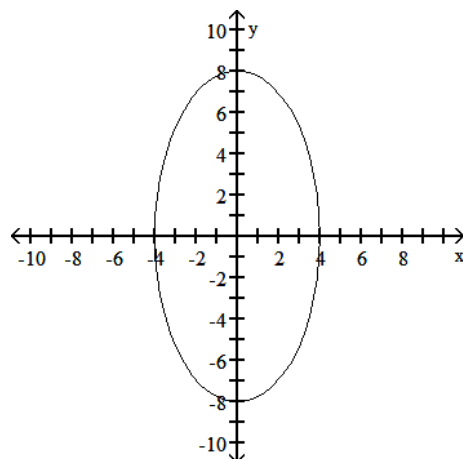
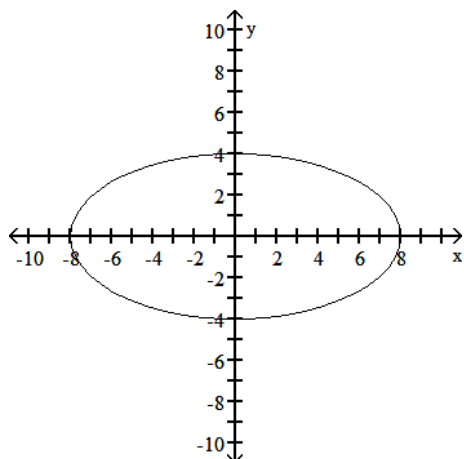
A) $\frac{x^2}{64} + \frac{y^2}{16} = 1$

B) $\frac{x^2}{16} + \frac{y^2}{64} = 1$



C) $\frac{x^2}{64} + \frac{y^2}{16} = 1$

D) $\frac{x^2}{16} + \frac{y^2}{64} = 1$



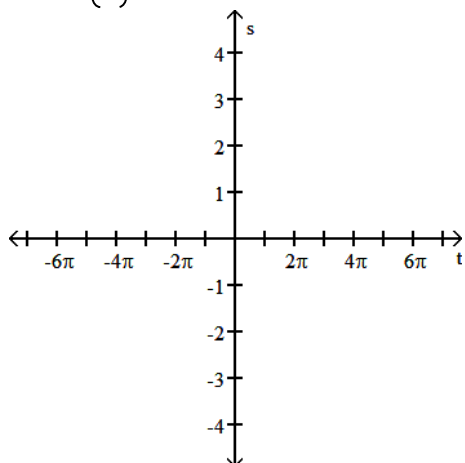
Answer: C

Explanation: A)
B)
C)
D)

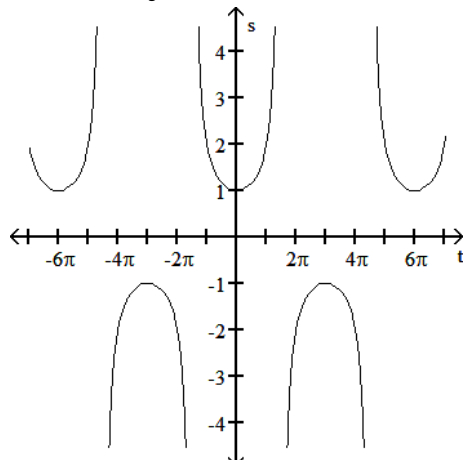
Graph the function in the ts-plane (t-axis horizontal, s-axis vertical). State the period and symmetry of the function.

38) $s = \sec\left(\frac{t}{3}\right)$

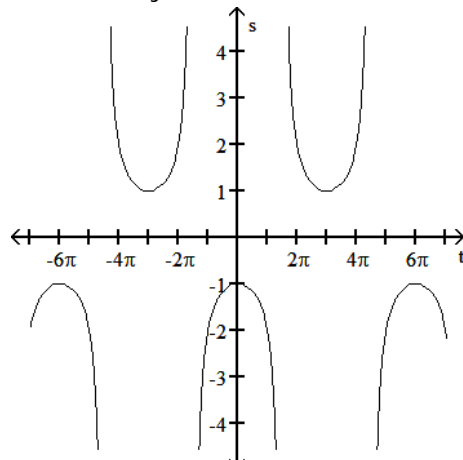
38) _____



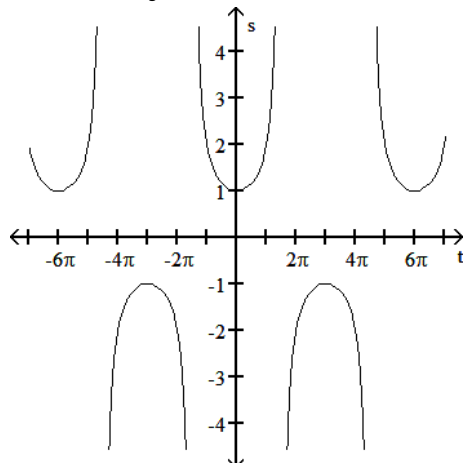
A) Period 6π , symmetric about the s-axis



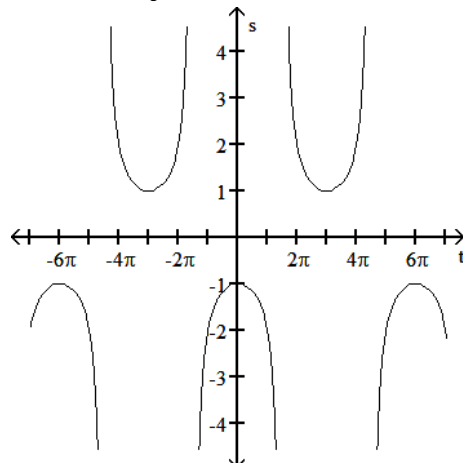
B) Period 6π , symmetric about the t-axis



C) Period 6π , symmetric about the t-axis



D) Period 6π , symmetric about the s-axis



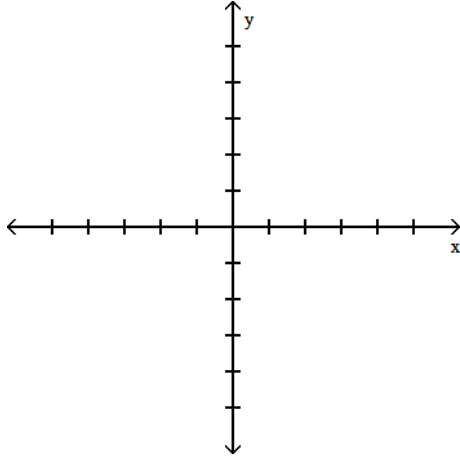
Answer: A

Explanation: A)
B)
C)
D)

Provide an appropriate response.

39) Graph the equation $y^2 = x$ and decide whether or not the graph represents a function of x .

39) _____



A) Function

B) Not a Function

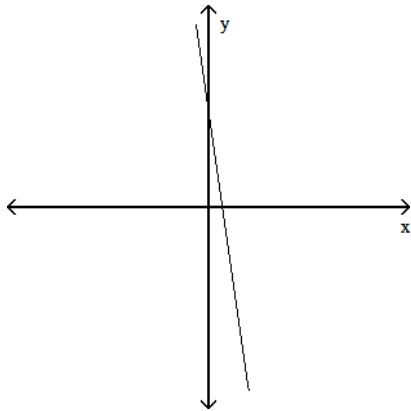
Answer: B

Explanation: A)
B)

Determine whether or not the graph is a graph of a function of x .

40)

40) _____



A) Function

B) Not a function

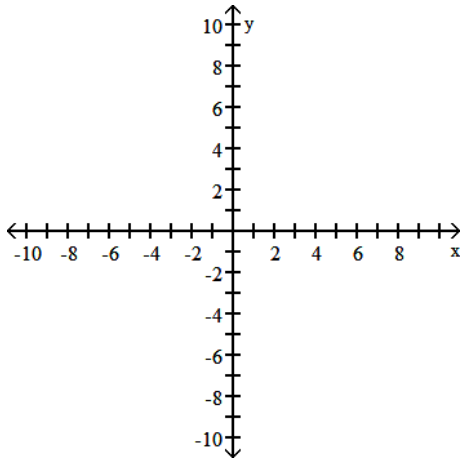
Answer: A

Explanation: A)
B)

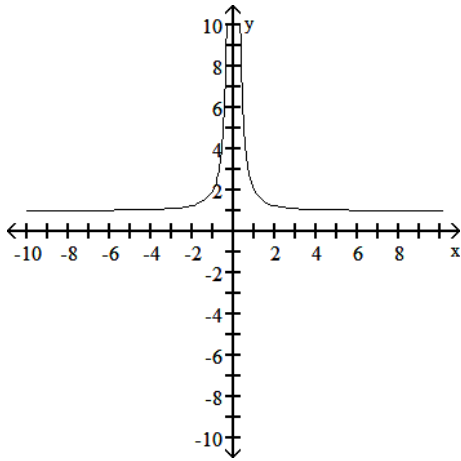
Graph the function.

41) $y = \frac{1}{(x - 1)^2}$

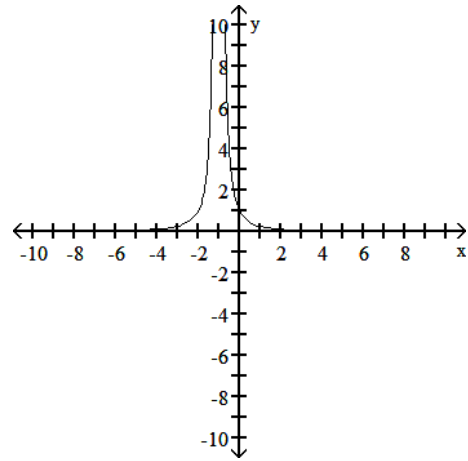
41) _____



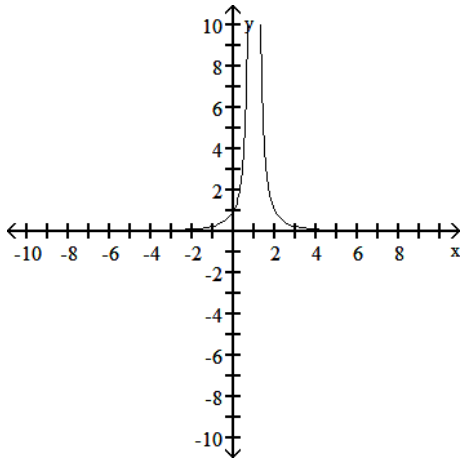
A)



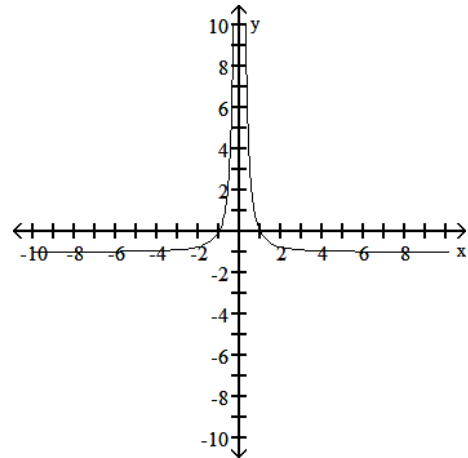
B)



C)



D)



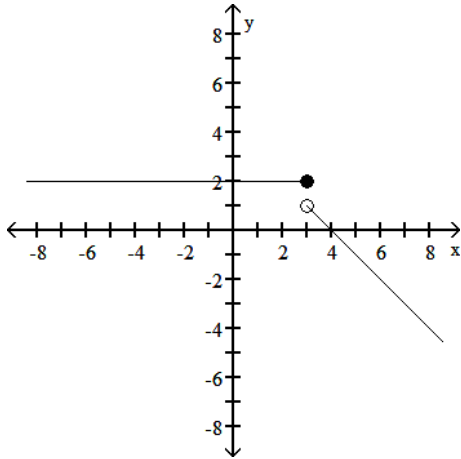
Answer: C

Explanation: A)
B)
C)
D)

Find a formula for the function graphed.

42)

42) _____



A) $f(x) = \begin{cases} 2, & x < 3 \\ x - 4, & x \geq 3 \end{cases}$

B) $f(x) = \begin{cases} 2, & x < 3 \\ 4 - x, & x > 3 \end{cases}$

C) $f(x) = \begin{cases} 2, & x < 0 \\ 4 - x, & x \geq 0 \end{cases}$

D) $f(x) = \begin{cases} 2, & x \leq 3 \\ 4 - x, & x > 3 \end{cases}$

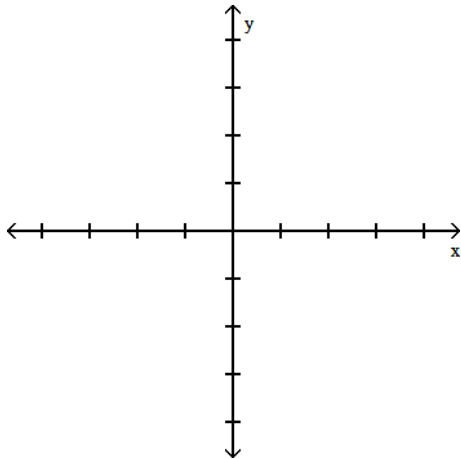
Answer: D

Explanation: A)
B)
C)
D)

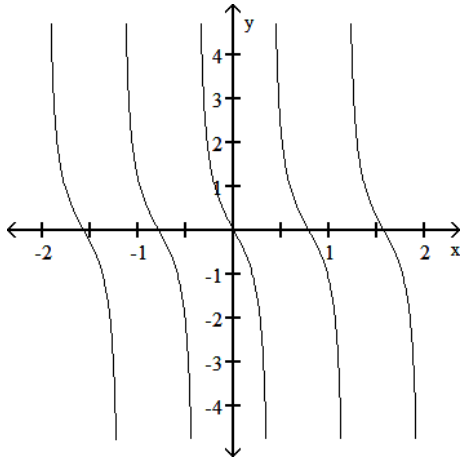
Graph the function.

43) Graph five periods of the function $f(x) = \tan 4x$.

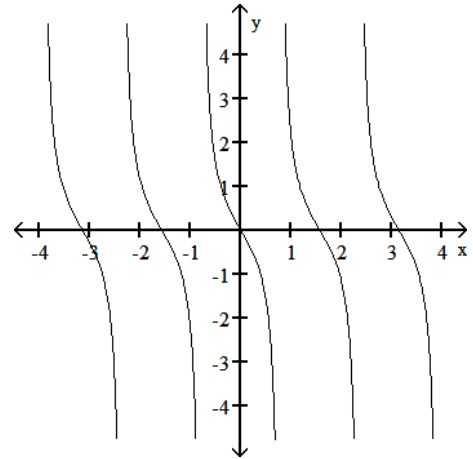
43) _____



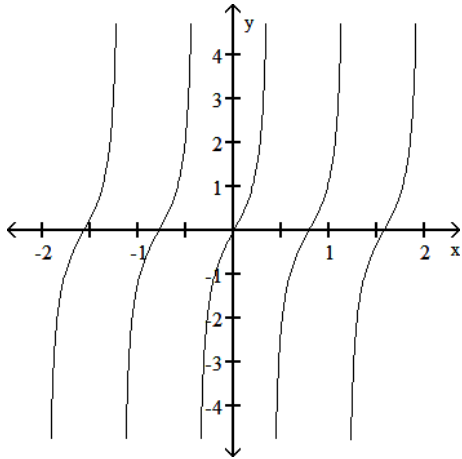
A)



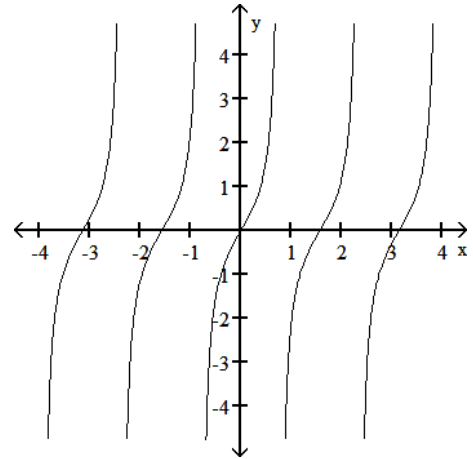
B)



C)



D)



Answer: C

Explanation: A)
B)
C)
D)

Express the given quantity in terms of $\sin x$ or $\cos x$.

44) $\sin(3\pi + x)$

A) $-\sin x$

B) $\cos x + \sin x$

C) $\sin x$

D) $\cos x - \sin x$

44) _____

Answer: A

Explanation: A)
B)
C)
D)

45) $\sin(2\pi - x)$

A) $\cos x - \sin x$

B) $\sin(-x)$

C) $-\sin x$

D) $\sin x$

45) _____

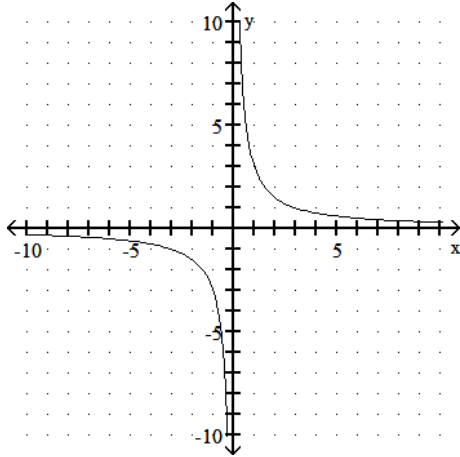
Answer: C

Explanation: A)
B)
C)
D)

Is the function graphed below one-to-one?

46)

46) _____



A) No

B) Yes

Answer: B

Explanation: A)
B)

Solve for t or y, as appropriate.

47) $e^{(\ln 0.5)t} = 0.3$

47) _____

A) $\frac{3}{5}$

B) $\frac{e^{0.3}}{\ln 0.5}$

C) $\frac{\ln 0.3}{\ln 0.5}$

D) $\ln \frac{3}{5}$

Answer: C

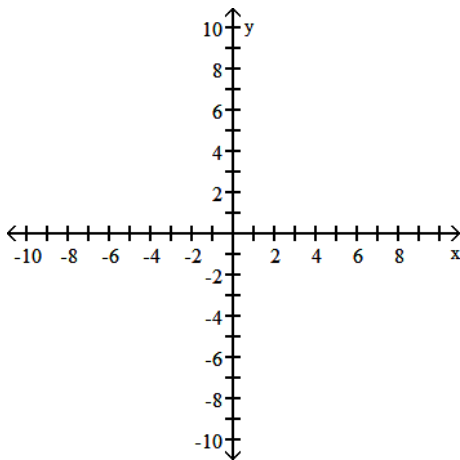
Explanation: A)
B)
C)
D)

The problem tells how many units and in what direction the graph of the given equation is to be shifted. Give an equation for the shifted graph. Then sketch the original graph with a dashed line and the shifted graph with a solid line.

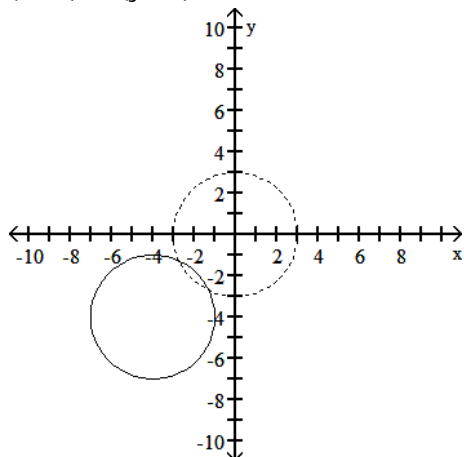
48) $x^2 + y^2 = 9$

Up 4, right 4

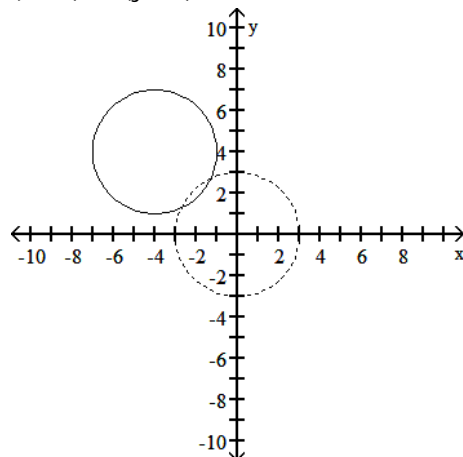
48) _____



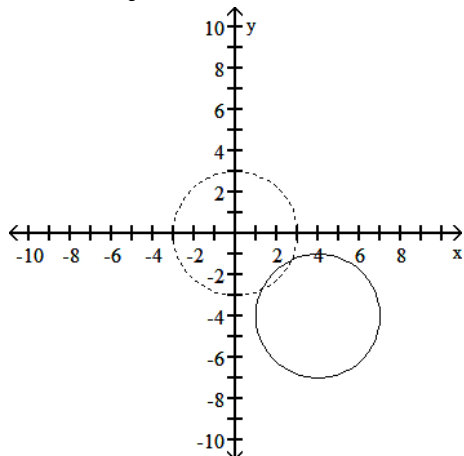
A) $(x + 4)^2 + (y + 4)^2 = 9$



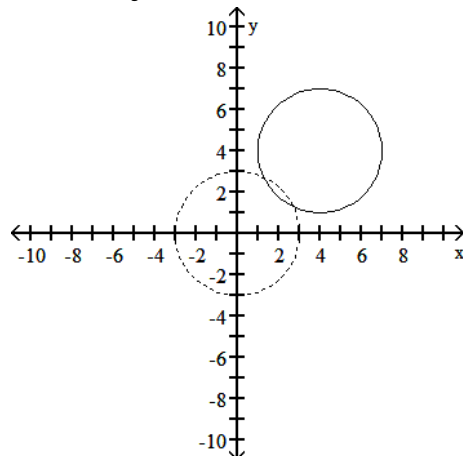
B) $(x + 4)^2 + (y - 4)^2 = 9$



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



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



Answer: D

Explanation: A)
B)
C)
D)

One of $\sin x$, $\cos x$, and $\tan x$ is given. Find the other two if x lies in the specified interval.

49) $\tan x = -\frac{3}{4}$, x in $\left[\frac{\pi}{2}, \pi\right]$

A) $\sin x = \frac{4}{5}$, $\cos x = -\frac{3}{5}$

C) $\sin x = -\frac{3}{5}$, $\cos x = \frac{4}{5}$

B) $\sin x = \frac{3}{5}$, $\cos x = \frac{4}{5}$

D) $\sin x = \frac{3}{5}$, $\cos x = -\frac{4}{5}$

49) _____

Answer: D

Explanation: A)
B)
C)
D)

Determine if the function is even, odd, or neither.

50) $f(x) = \frac{5}{x^2 + 4}$

50) _____

A) Even

B) Odd

C) Neither

Answer: A

Explanation: A)
B)
C)

One of $\sin x$, $\cos x$, and $\tan x$ is given. Find the other two if x lies in the specified interval.

51) $\cos x = \frac{5}{13}$, x in $\left[-\frac{\pi}{2}, 0\right]$

51) _____

A) $\sin x = \frac{12}{13}$, $\tan x = \frac{12}{5}$

B) $\sin x = -\frac{12}{13}$, $\tan x = -\frac{12}{5}$

C) $\sin x = -\frac{12}{13}$, $\tan x = -\frac{5}{12}$

D) $\sin x = \frac{12}{13}$, $\tan x = -\frac{5}{12}$

Answer: B

Explanation: A)
B)
C)
D)

Find the formula for the function.

52) Express the perimeter of a square as a function of the square's side length x .

52) _____

A) $p = x^3$

B) $p = \frac{3x}{2}$

C) $p = 4x$

D) $p = 6x$

Answer: C

Explanation: A)
B)
C)
D)

Provide an appropriate response.

53) Graph the functions $f(x) = \frac{4}{x-1}$ and $g(x) = \frac{2}{x+1}$ together to identify the values of x for which $\frac{4}{x-1}$

53) _____

$< \frac{2}{x+1}$.

Confirm your findings algebraically.

A) $(-1, 1) \cup (1, \infty)$

B) $(-3, -1) \cup (1, \infty)$

C) $(-\infty, -3)$

D) $(-3, \infty)$

Answer: C

Explanation: A)
B)
C)
D)

The problem tells by what factor and direction the graph of the given function is to be stretched or compressed. Give an equation for the stretched or compressed graph.

54) $y = x^2 + 4$ stretched horizontally by a factor of 3

54) _____

- A) $y = 9x^2 + 4$ B) $y = \frac{x^2}{9} + 4$ C) $y = 3x^2 + 12$ D) $y = \frac{x^2}{3} + 4$

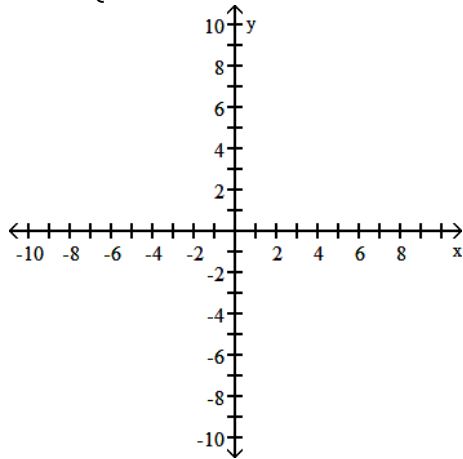
Answer: B

Explanation: A)
B)
C)
D)

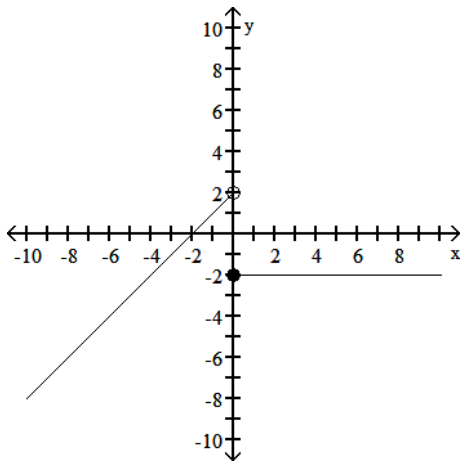
Graph the function.

55) $G(x) = \begin{cases} |x| - 2, & x < 0 \\ -2, & x \geq 0 \end{cases}$

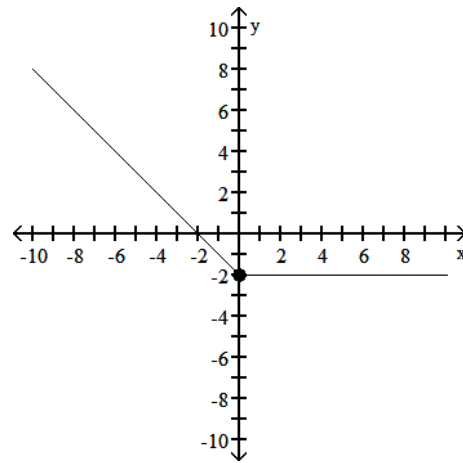
55) _____

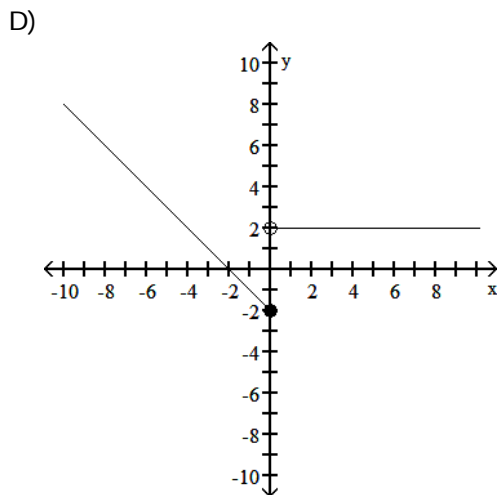
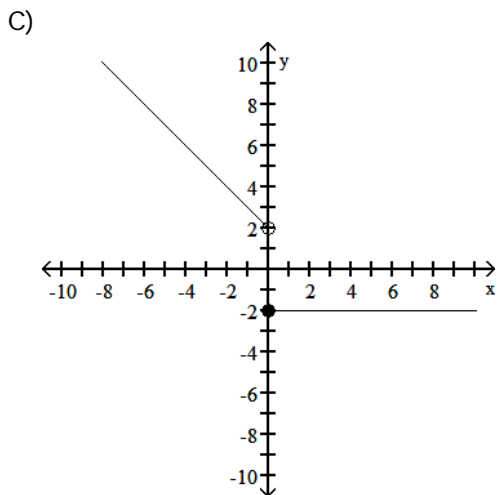


A)



B)





Answer: B
 Explanation: A)
 B)
 C)
 D)

Find the domain and range for the indicated function.

56) $f(x) = \sqrt{x + 13}$, $g(x) = \sqrt{x - 13}$; $g - f$

A) D: $x \geq -13$

B) D: $x \geq 13$

C) D: $x \geq 13$

D) D: $x \geq 13$

R: $y \geq -\sqrt{26}$

R: $y \geq -\sqrt{26}$

R: $y \geq -\sqrt{26}$

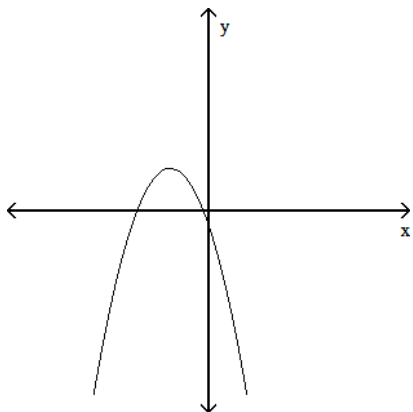
R: $y \geq 0$

56) _____

Answer: B
 Explanation: A)
 B)
 C)
 D)

Determine whether or not the graph is a graph of a function of x.

57)



A) Function

B) Not a function

Answer: A
 Explanation: A)
 B)

57) _____

Solve the problem.

58) You have money in an account at 10% interest, compounded monthly. To the nearest year, how long will it take for your money to double?

58) _____

A) 6 yr

B) 7 yr

C) 10 yr

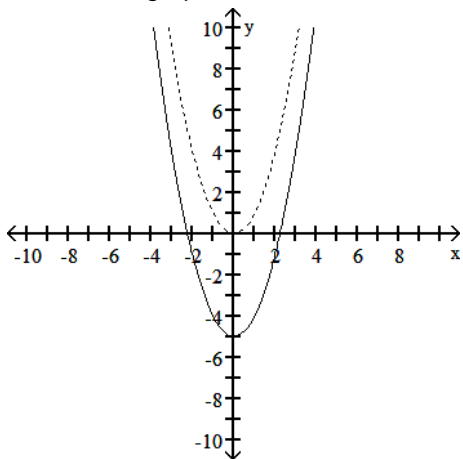
D) 4 yr

Answer: B

Explanation: A)
B)
C)
D)

59) The accompanying figure shows the graph of $y = x^2$ shifted to a new position. Write the equation for the new graph.

59) _____



A) $y = x^2 + 5$

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

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

D) $y = x^2 - 5$

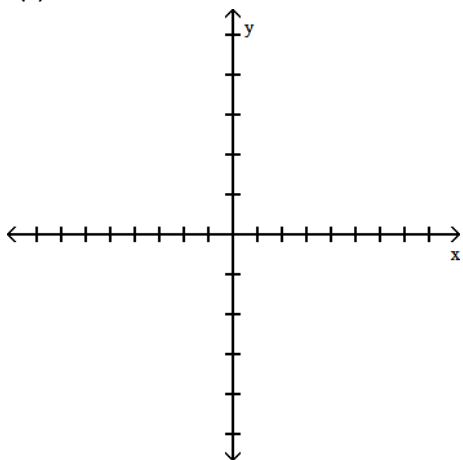
Answer: D

Explanation: A)
B)
C)
D)

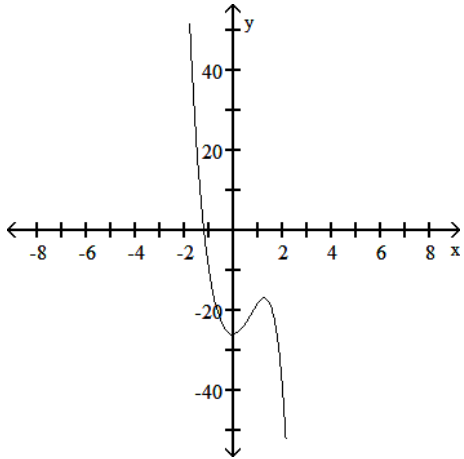
Determine an appropriate viewing window for the given function and use it to display its graph.

60) $f(x) = x^4 - 4x^3 + 12x^2 + x - 26$

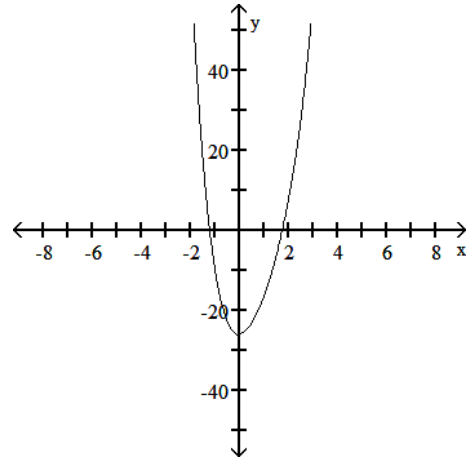
60) _____



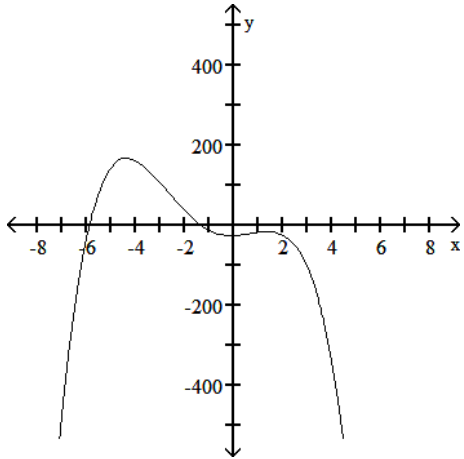
A)



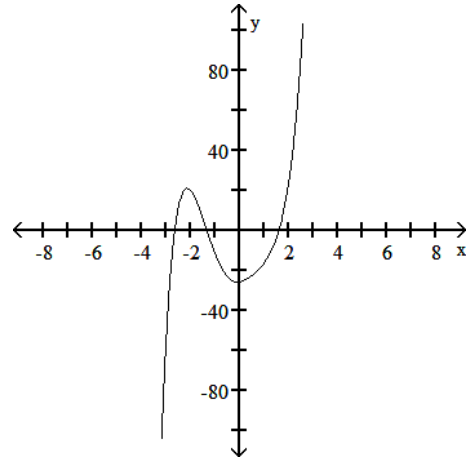
B)



C)



D)

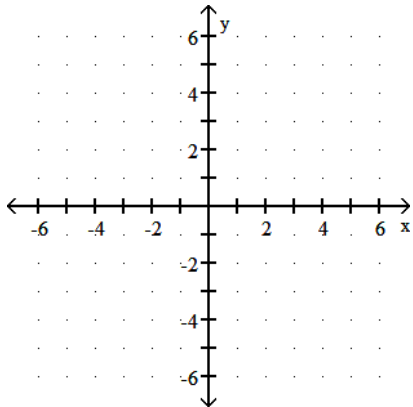


Answer: B

Explanation: A)
B)
C)
D)

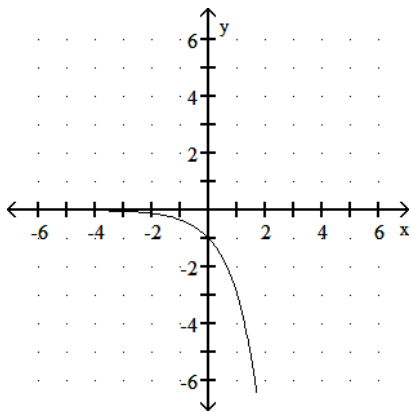
Graph the function.

61) $f(x) = 3^x$

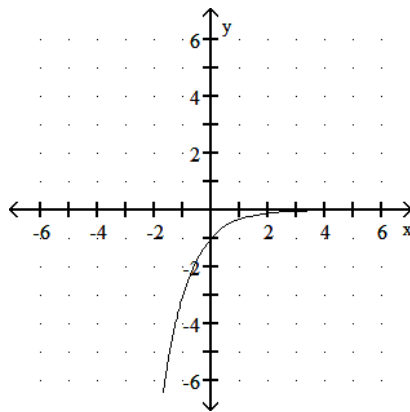


61) _____

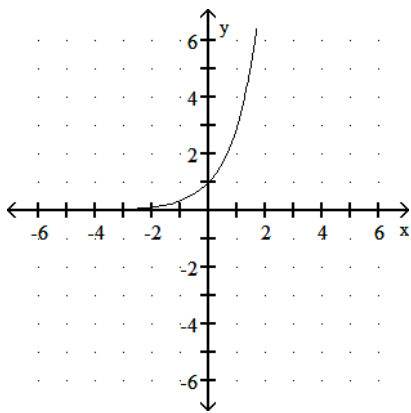
A)



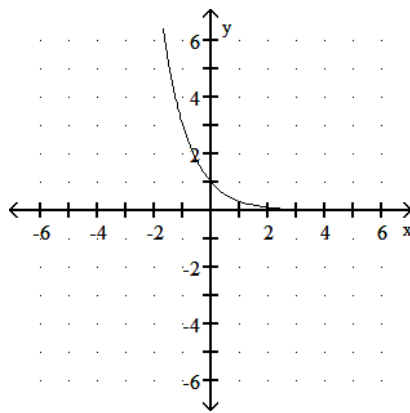
B)



C)



D)



Answer: C

Explanation: A)
 B)
 C)
 D)

Solve the problem.

62) 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. A certain radioactive isotope has a half-life of approximately 1850 years. How many years would be required for a given amount of this isotope to decay to 20% of that amount? 62) _____

- A) 4276 yr B) 4296 yr C) 596 yr D) 1480 yr

Answer: B

Explanation: A)
 B)
 C)
 D)

Use the laws of exponents to simplify. Do not use negative exponents in your answer.

63) $\frac{7^{6/13}}{7^{-3/13}}$

63) _____

A) $7^{9/13}$

B) $7^{3/13}$

C) $7^{6/13} - 7^{3/13}$

D) $7^{-18/169}$

Answer: A

Explanation: A)
B)
C)
D)

Solve for t or y, as appropriate.

64) $e^{t/980} = k$

64) _____

A) $\frac{\ln k}{980}$

B) $\ln 980k$

C) $980e^k$

D) $980 \ln k$

Answer: D

Explanation: A)
B)
C)
D)

Find the exact value of the trigonometric function. Do not use a calculator or tables.

65) $\sec\left(\frac{\pi}{4}\right)$

65) _____

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

B) $\sqrt{3}$

C) $\sqrt{2}$

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

Answer: C

Explanation: A)
B)
C)
D)

Express the given function as a composite of functions f and g such that $y = f(g(x))$.

66) $y = (8x - 19)^4$

66) _____

A) $f(x) = 8x - 19, g(x) = x^4$

B) $f(x) = x^4, g(x) = 8x - 19$

C) $f(x) = 8x^4, g(x) = x - 19$

D) $f(x) = (8x)^4, g(x) = -19$

Answer: B

Explanation: A)
B)
C)
D)

Express as a single logarithm and, if possible, simplify.

$$67) \ln(2x^2 - 14x) + \ln\left(\frac{1}{2x}\right)$$

67) _____

A) $\ln(x - 7)$

B) $\ln\left(2x^2 - 14x + \frac{1}{2x}\right)$

C) $\ln(x - 14)$

D) $\ln(4x^2(x - 7))$

Answer: A

Explanation: A)
B)
C)
D)

Express the following logarithm as specified.

$$68) \ln \sqrt[3]{9} \text{ in terms of } \ln 3$$

68) _____

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

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

C) $6 \ln 3$

D) $\frac{1}{3} \ln 9$

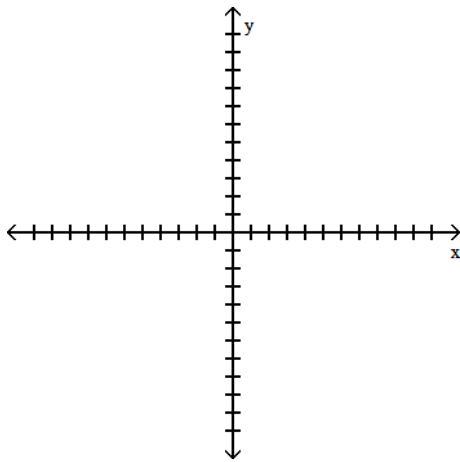
Answer: A

Explanation: A)
B)
C)
D)

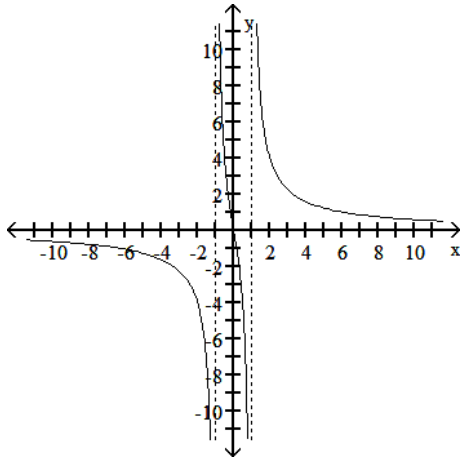
Determine an appropriate viewing window for the given function and use it to display its graph.

$$69) f(x) = \frac{x^3}{x^2 - 1}$$

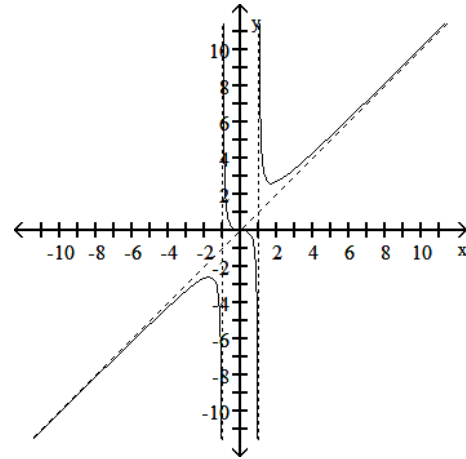
69) _____



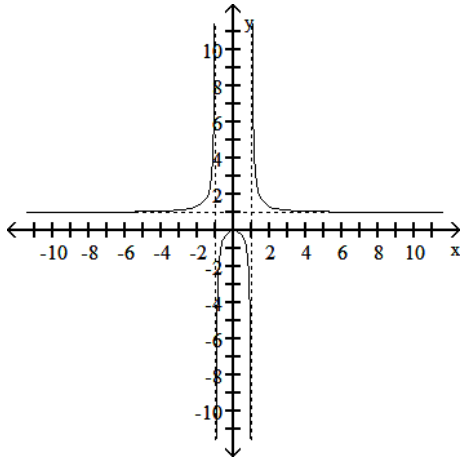
A)



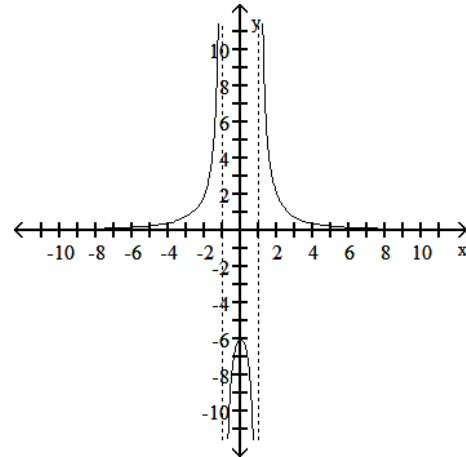
B)



C)



D)



Answer: B

Explanation: A)
B)
C)
D)

Use a graph to find an approximate solution to the equation. Round to the nearest thousandth.

70) $155(1.29)^{x/8} = 310$

A) 21.776

B) 2.939

C) 23.266

D) 20.286

70) _____

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

71) You want to make an angle measuring 95° by marking an arc on the perimeter of a disk with a diameter of 8 inches and drawing lines from the ends of the arc to the disk's center. To the nearest tenth of an inch, how long should the arc be?

71) _____

- A) 3.3 in. B) 26.5 in. C) 13.3 in. D) 6.6 in.

Answer: D

Explanation: A)
B)
C)
D)

Find the inverse of the function.

72) $f(x) = (x - 1)^2, x \geq 1$

72) _____

A) $f^{-1}(x) = \sqrt{x - 1}, x \geq 1$

B) Not a one-to-one function

C) $f^{-1}(x) = \sqrt{x} + 1, x \geq 0$

D) $f^{-1}(x) = -\sqrt{x} + 1, x \geq 0$

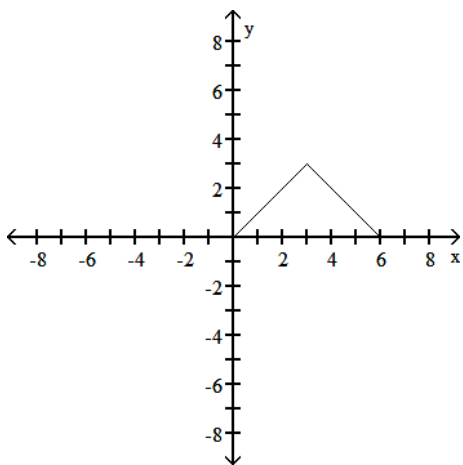
Answer: C

Explanation: A)
B)
C)
D)

Find a formula for the function graphed.

73)

73) _____



A) $f(x) = \begin{cases} x, & 0 \leq x \leq 3 \\ 6 - x, & 3 < x \leq 6 \end{cases}$

B) $f(x) = \begin{cases} x + 6, & 0 \leq x \leq 3 \\ -x, & 3 < x \leq 6 \end{cases}$

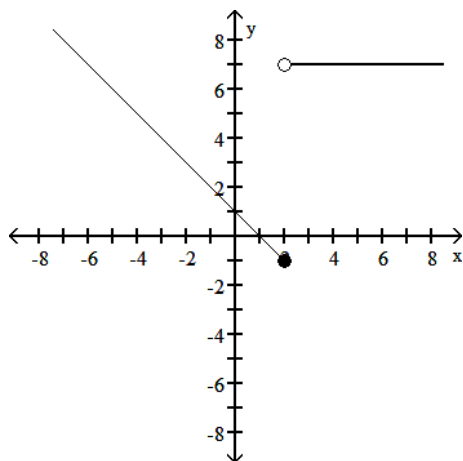
C) $f(x) = \begin{cases} -x, & 0 \leq x \leq 3 \\ x + 6, & 3 < x \leq 6 \end{cases}$

D) $f(x) = \begin{cases} 6 - x, & 0 \leq x \leq 3 \\ x, & 3 < x \leq 6 \end{cases}$

Answer: A

Explanation: A)
B)
C)
D)

74)



$$\text{A) } f(x) = \begin{cases} 1 - x, & x < 2 \\ 7 & x \geq 2 \end{cases}$$

$$\text{C) } f(x) = \begin{cases} 1 - x, & x \leq 2 \\ 7 & x > 2 \end{cases}$$

$$\text{B) } f(x) = \begin{cases} 1 + x, & x < 2 \\ 7 & x > 2 \end{cases}$$

$$\text{D) } f(x) = \begin{cases} 1 + x, & x \leq 2 \\ 7 & x > 2 \end{cases}$$

Answer: C

Explanation: A)
B)
C)
D)

Express the given function as a composite of functions f and g such that $y = f(g(x))$.

75) $y = \frac{1}{x^2} + 8$

A) $f(x) = \frac{1}{x}, g(x) = \frac{1}{x} + 8$

B) $f(x) = x, g(x) = \frac{1}{x} + 8$

C) $f(x) = \frac{1}{x^2}, g(x) = 8$

D) $f(x) = x + 8, g(x) = \frac{1}{x^2}$

Answer: D

Explanation: A)
B)
C)
D)

Find the exact value of the trigonometric function. Do not use a calculator or tables.

76) $\sec\left(-\frac{3\pi}{2}\right)$

A) 1

B) 0

C) -1

D) Undefined

Answer: D

Explanation: A)
B)
C)
D)

State the period of the function and graph.

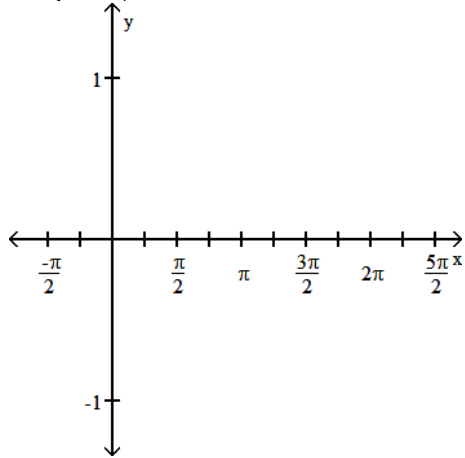
74) _____

75) _____

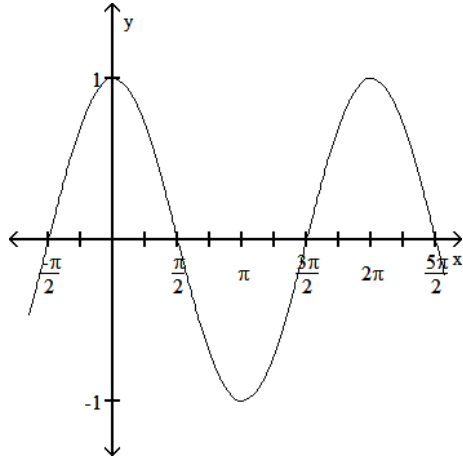
76) _____

77) $\cos\left(x + \frac{\pi}{2}\right)$

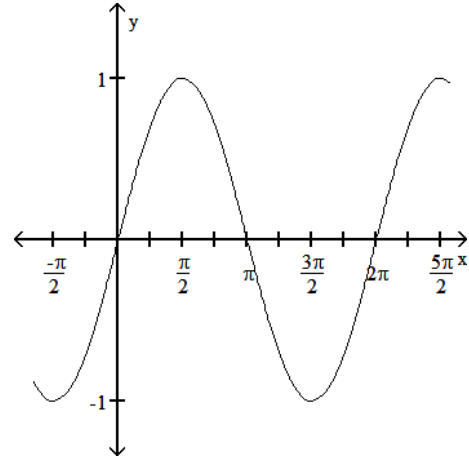
77) _____



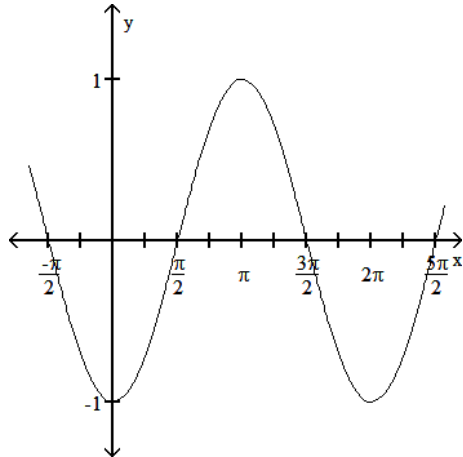
A) Period 2π



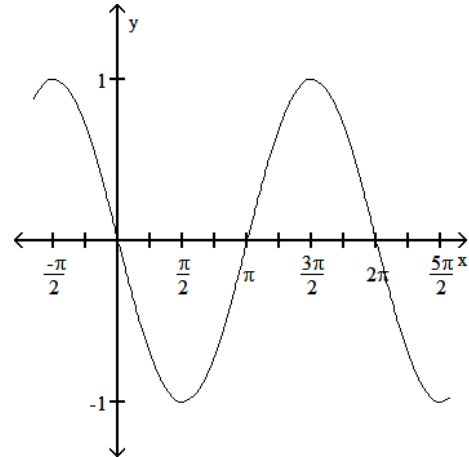
B) Period 2π



C) Period 2π



D) Period 2π



Answer: D

Explanation: A)
B)
C)
D)

Simplify the expression.

78) $\log_6 \sqrt[5]{\frac{1}{36}}$

78) _____

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

B) $-\frac{5}{2}$

C) $\frac{5}{2}$

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

Answer: A

Explanation: A)
B)
C)
D)

Express the following logarithm as specified.

79) $\ln \sqrt{40.5}$ in terms of $\ln 3$ and $\ln 2$

79) _____

A) $4 \ln 3$

B) $\frac{4 \ln 3 + \ln 2}{2}$

C) $\frac{4 \ln 3}{2}$

D) $\frac{4 \ln 3 - \ln 2}{2}$

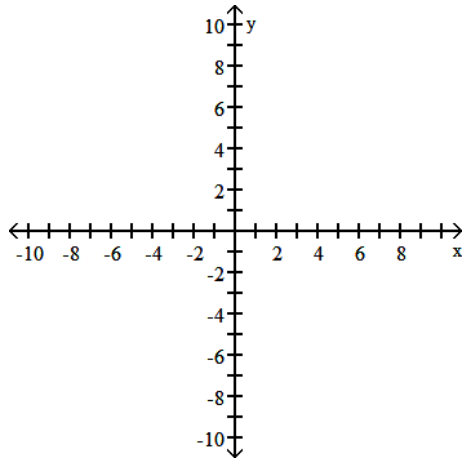
Answer: D

Explanation: A)
B)
C)
D)

Find the domain and graph the function.

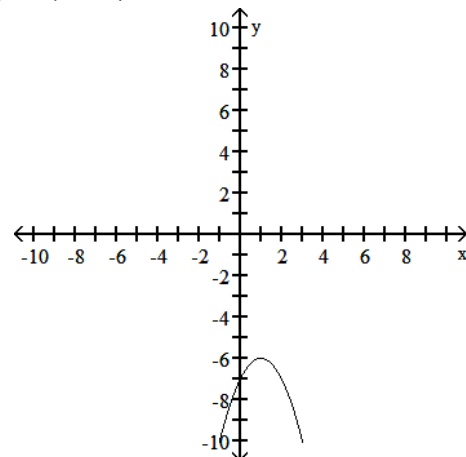
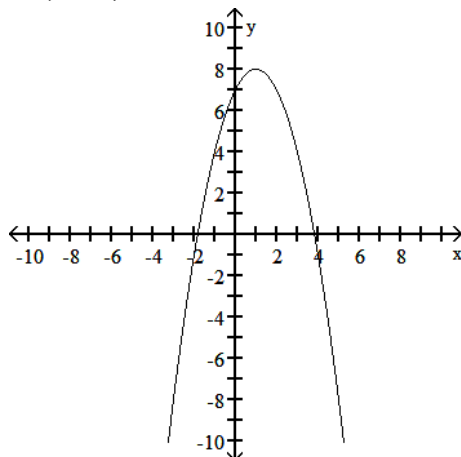
80) $g(x) = -7 + 2x - x^2$

80) _____

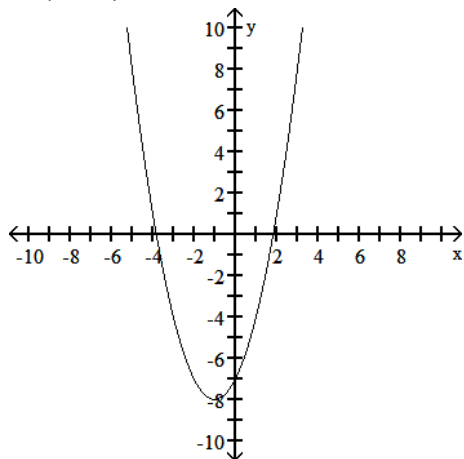


A) D: $(-\infty, \infty)$

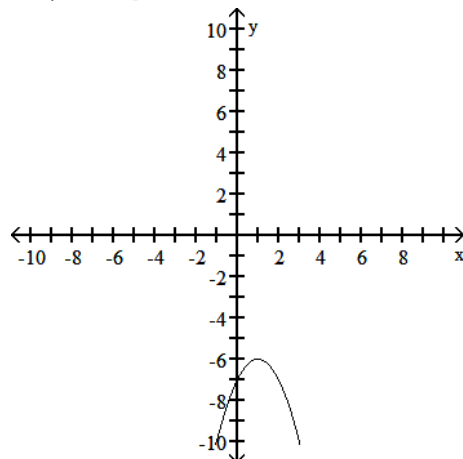
B) D: $(-\infty, \infty)$



C) $D: (-\infty, \infty)$



D) $D: (-\infty, -6]$



Answer: B

- Explanation: A)
B)
C)
D)

Assume that f is an even function, g is an odd function, and both f and g are defined on the entire real line. State whether the combination of functions (where defined) is even or odd.

81) f/g

A) Even

B) Odd

81) _____

Answer: B

- Explanation: A)
B)

Express the given quantity in terms of $\sin x$ or $\cos x$.

82) $\cos(6\pi + x)$

A) $-\cos x$

B) $-\sin x$

C) $\cos x - \sin x$

D) $\cos x$

82) _____

Answer: D

- Explanation: A)
B)
C)
D)

Use the laws of exponents to simplify. Do not use negative exponents in your answer.

83) $(6^{-8})^{-3}$

A) $\frac{1}{6^{24}}$

B) $\frac{1}{6^{11}}$

C) 6^{24}

D) 6^{11}

83) _____

Answer: C

- Explanation: A)
B)
C)
D)

Find the requested information using the law of cosines and/or the law of sines. Round to three decimal places.

84) A triangle has sides $a = 5$ and $b = 2$ and angle $C = 60^\circ$. Find the sine of B .

84) _____

A) 0.199

B) 0.993

C) 0.099

D) 0.397

Answer: D

Explanation: A)
B)
C)
D)

Find the domain and range of the function.

85) $g(z) = \frac{-5}{\sqrt{z+1}}$

85) _____

A) D: $(-\infty, -1)$, R: $(0, \infty)$

B) D: $[1, \infty)$, R: $(-\infty, \infty)$

C) D: $(-1, \infty)$, R: $(-\infty, 0)$

D) D: $[0, \infty)$, R: $(-\infty, \infty)$

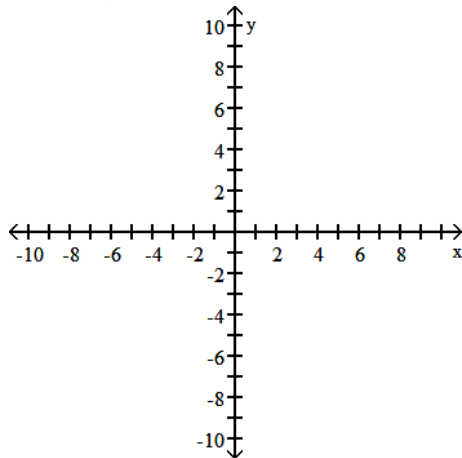
Answer: C

Explanation: A)
B)
C)
D)

The equation of an ellipse is given. Put the equation in standard form and sketch the ellipse.

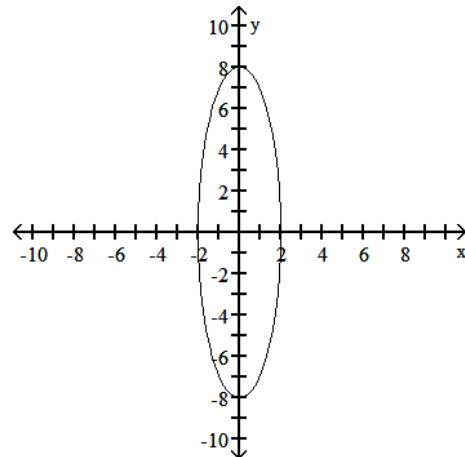
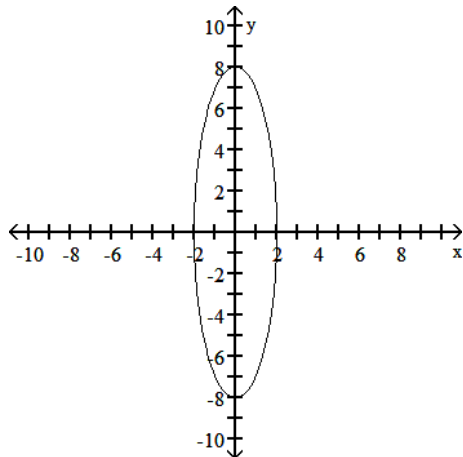
86) $64x^2 + 4y^2 = 256$

86) _____

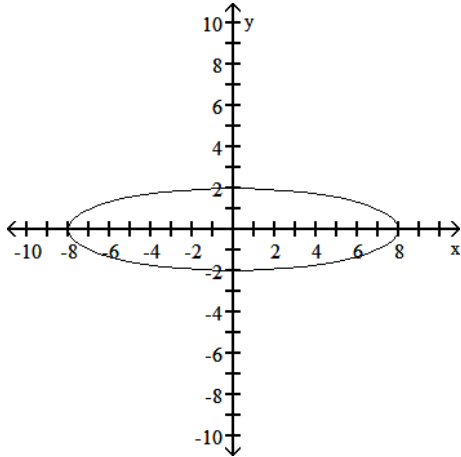


A) $\frac{x^2}{64} + \frac{y^2}{4} = 1$

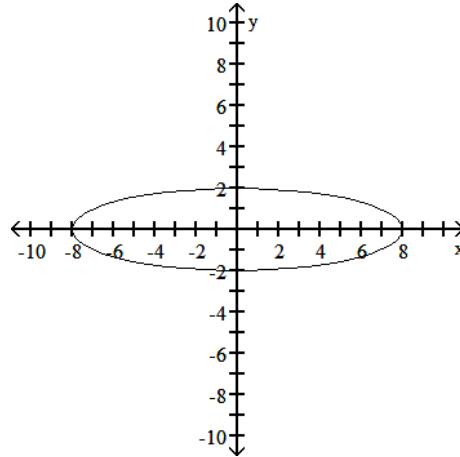
B) $\frac{x^2}{4} + \frac{y^2}{64} = 1$



C) $\frac{x^2}{4} + \frac{y^2}{64} = 1$



D) $\frac{x^2}{64} + \frac{y^2}{4} = 1$



Answer: B
 Explanation: A)
 B)
 C)
 D)

The problem tells by what factor and direction the graph of the given function is to be stretched or compressed. Give an equation for the stretched or compressed graph.

- 87) $y = x^3 + 1$ stretched vertically by a factor of 3 87) _____
- A) $y = 3x^3 + 1$ B) $y = 27x^3 + 1$ C) $y = \frac{x^3}{3} + \frac{1}{3}$ D) $y = 3x^3 + 3$

Answer: D
 Explanation: A)
 B)
 C)
 D)

Solve the problem.

- 88) A bacteria colony doubles in 7 hr. How long does it take the colony to triple? Use $N = N_0 2^{t/T}$, 88) _____
 where N_0 is the initial number of bacteria and T is the time in hours it takes the colony to double.
 (Round to the nearest hundredth, as necessary.)
 A) 10.5 hr B) 21 hr C) 11.09 hr D) 2.84 hr

Answer: C
 Explanation: A)
 B)
 C)
 D)

Find the inverse of the function.

89) $f(x) = \sqrt{x+9}, x \geq -9$

A) $f^{-1}(x) = -x^2 + 9, x \geq 0$

C) $f^{-1}(x) = x^2 - 9, x \geq 0$

Answer: C

Explanation: A)

B)

C)

D)

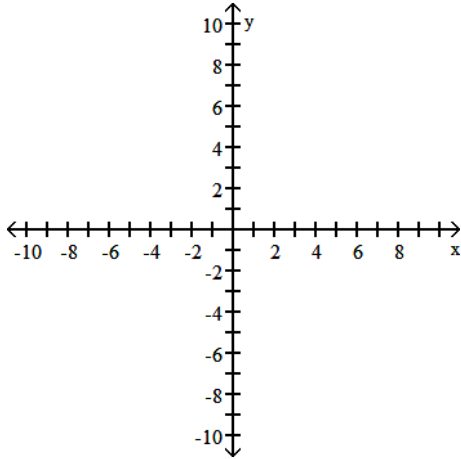
B) $f^{-1}(x) = x^2 - 81, x \geq 0$

D) Not a one-to-one function

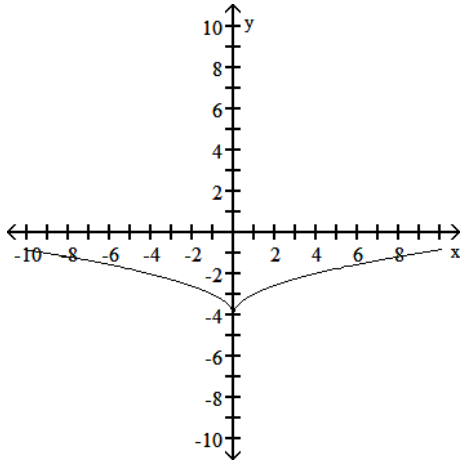
89) _____

Graph the function.

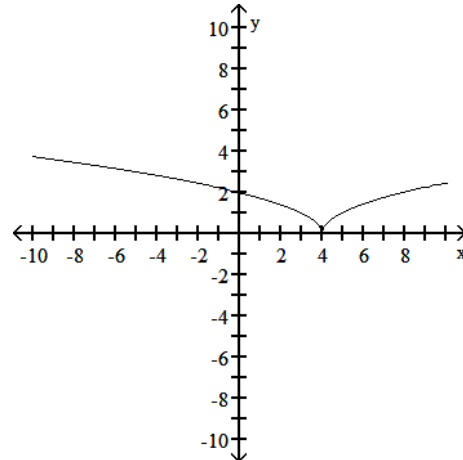
90) $y = \sqrt{|x|} - 4$



A)

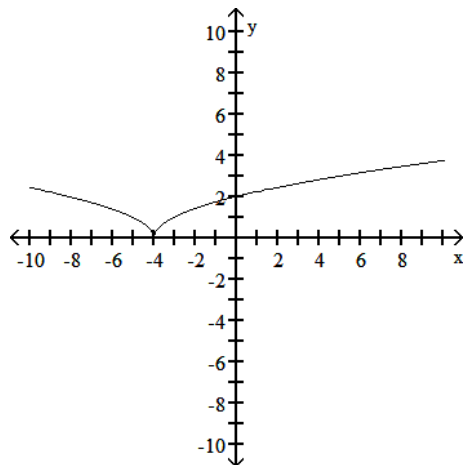


B)

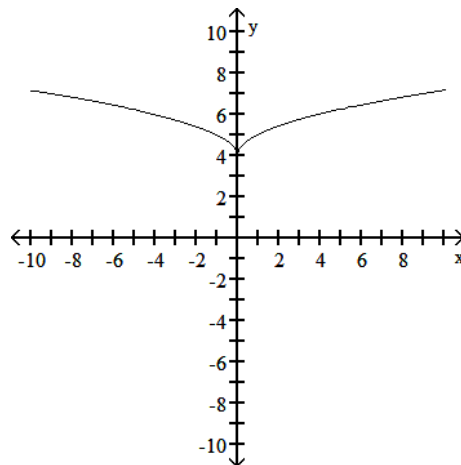


90) _____

C)



D)

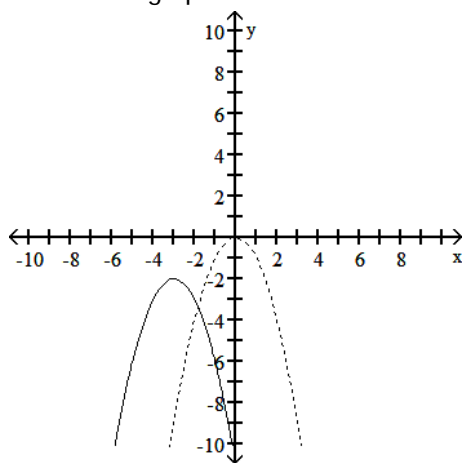


Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

91) The accompanying figure shows the graph of $y = -x^2$ shifted to a new position. Write the equation for the new graph. 91) _____



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

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

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

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

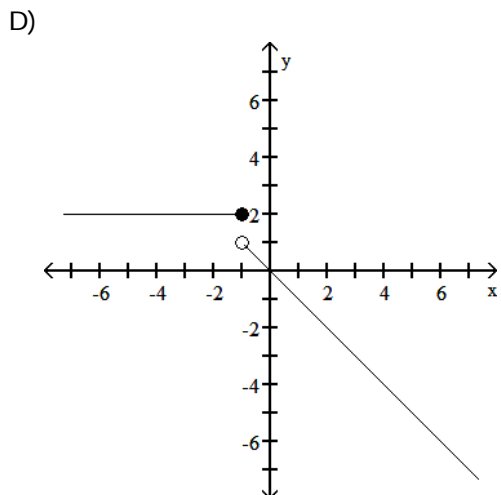
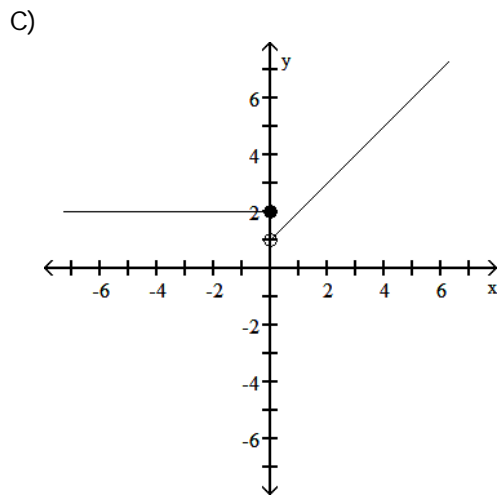
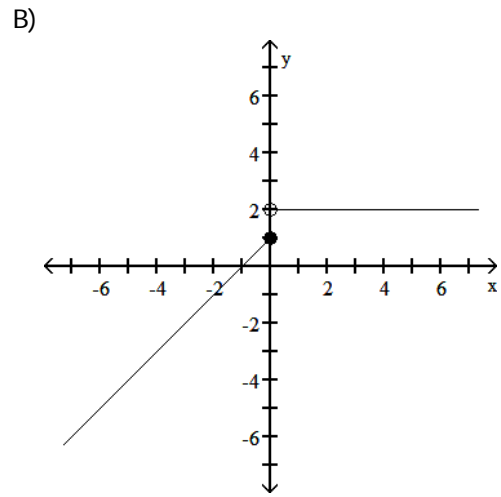
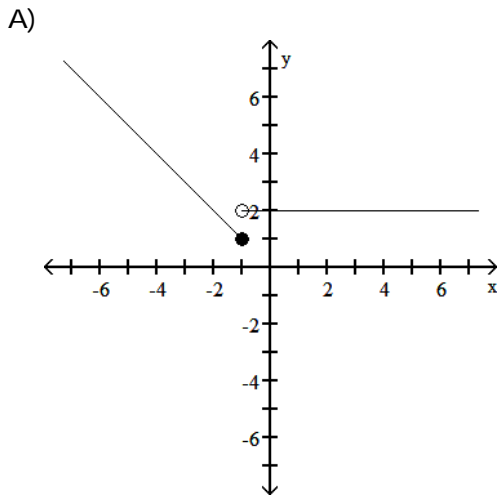
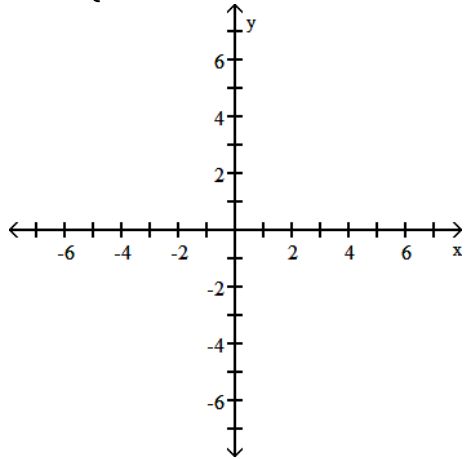
Answer: C

Explanation: A)
B)
C)
D)

Graph the function.

$$92) g(x) = \begin{cases} 2 & x \leq 0 \\ x + 1 & x > 0 \end{cases}$$

92) _____



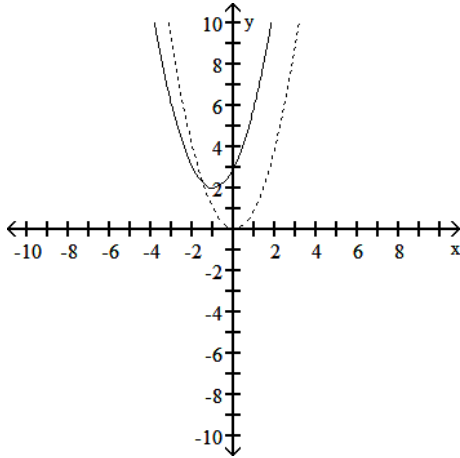
Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

93) The accompanying figure shows the graph of $y = x^2$ shifted to a new position. Write the equation for the new graph.

93) _____



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

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

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

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

Answer: D

Explanation: A)
B)
C)
D)

94) If $f(x) = \sqrt{x + 5}$ and $g(x) = 8x - 9$, find $f(g(x))$.

94) _____

A) $8\sqrt{x + 5} - 9$

B) $2\sqrt{2x + 1}$

C) $8\sqrt{x - 4}$

D) $2\sqrt{2x - 1}$

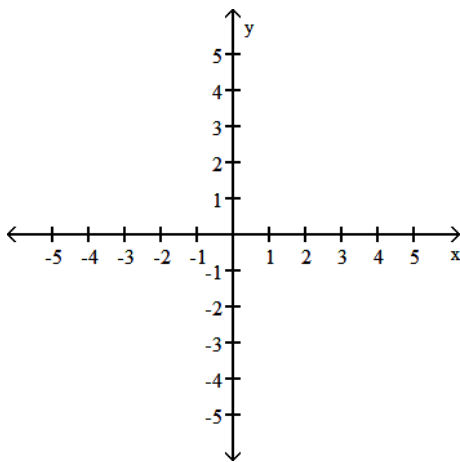
Answer: D

Explanation: A)
B)
C)
D)

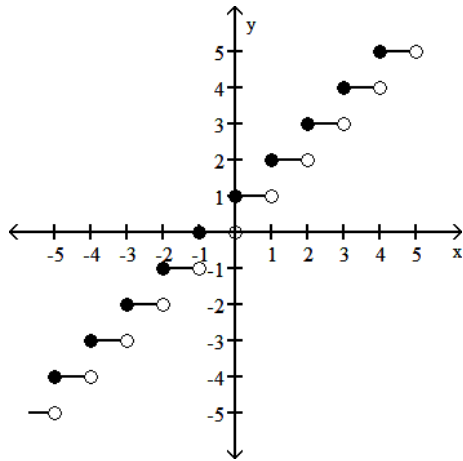
Provide an appropriate response.

95) Graph the function $f(x) = \lceil x \rceil$.

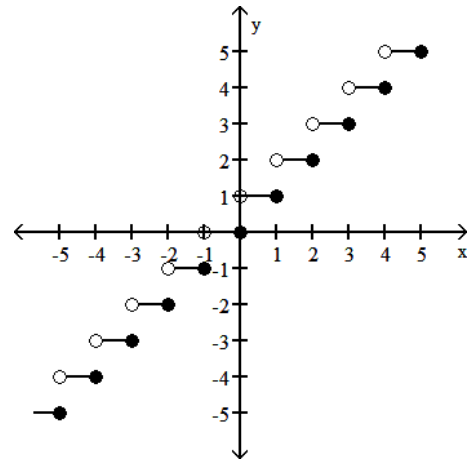
95) _____



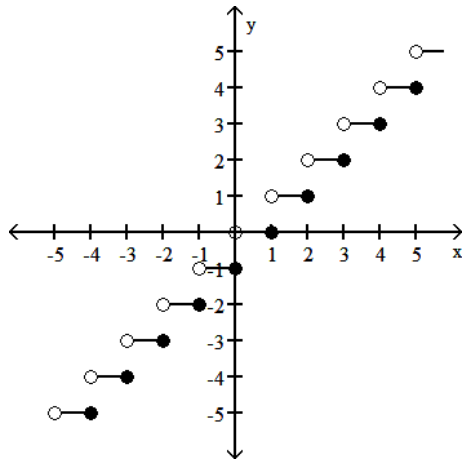
A)



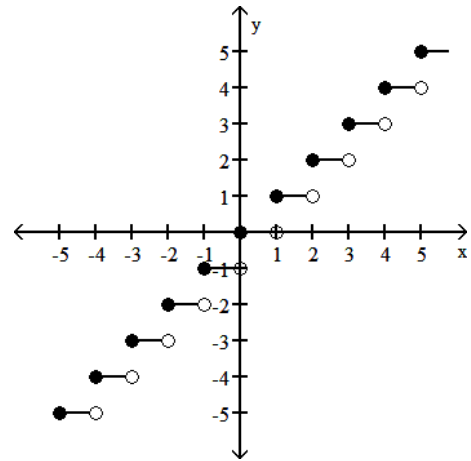
B)



C)



D)



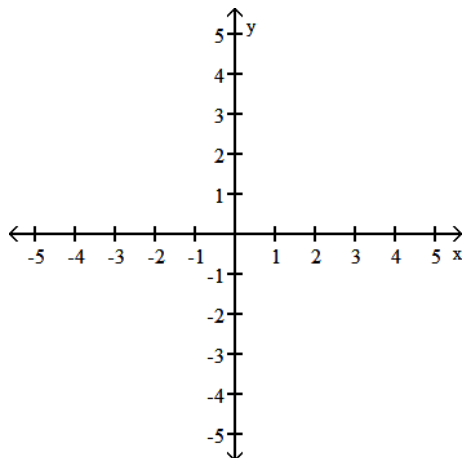
Answer: B

Explanation: A)
B)
C)
D)

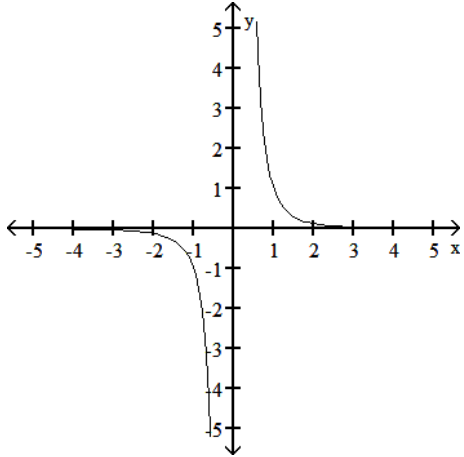
Graph the function. Specify the intervals over which the function is increasing and the intervals where it is decreasing.

96) $y = \frac{1}{x^3}$

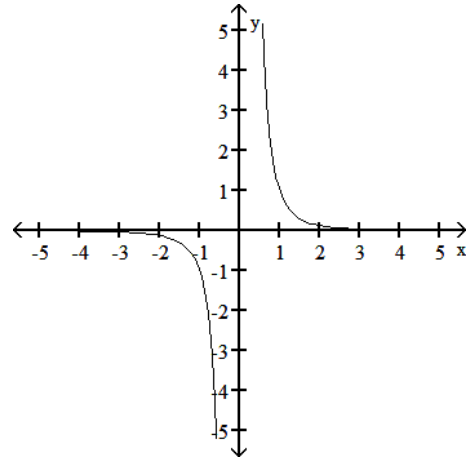
96) _____



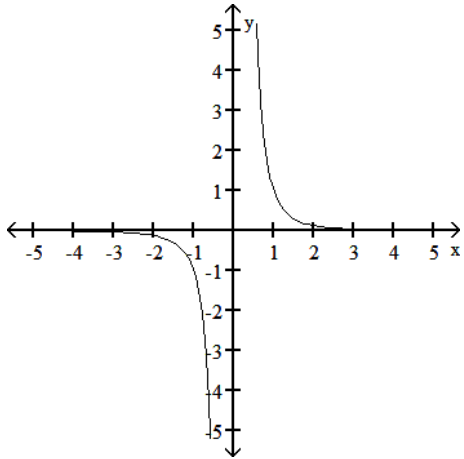
A) Decreasing $-\infty < x < 0$;
Increasing $0 < x < \infty$



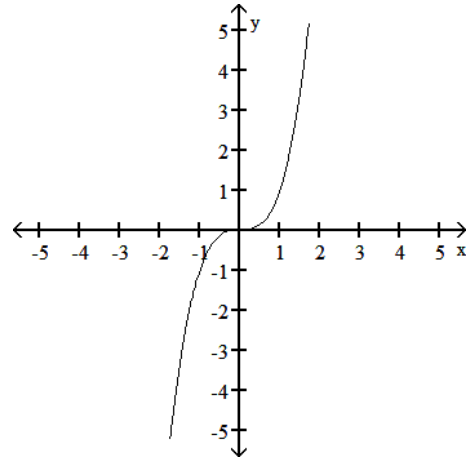
B) Decreasing $-\infty < x < 0$ and $0 < x < \infty$



C) Increasing $-\infty < x < 0$ and $0 < x < \infty$



D) Increasing $-\infty < x < \infty$

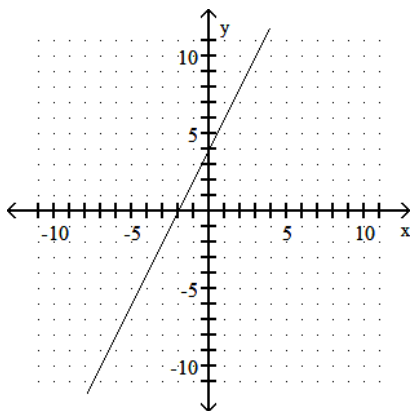


Answer: B

Explanation: A)
B)
C)
D)

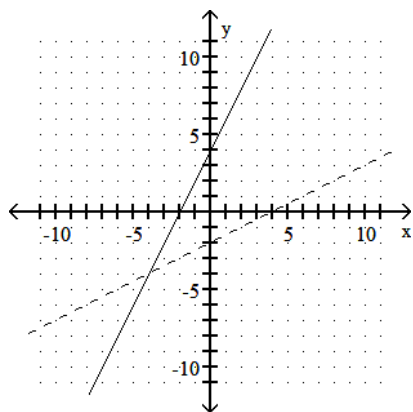
Graph the inverse of the function plotted, on the same set of axes. Use a dashed curve for the inverse.

97)

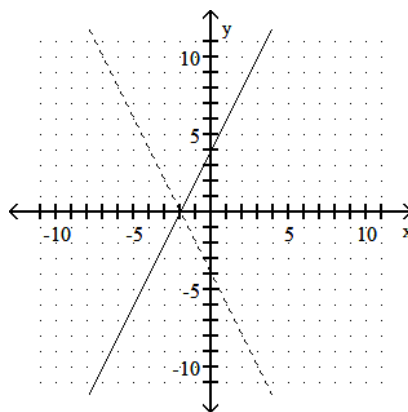


97) _____

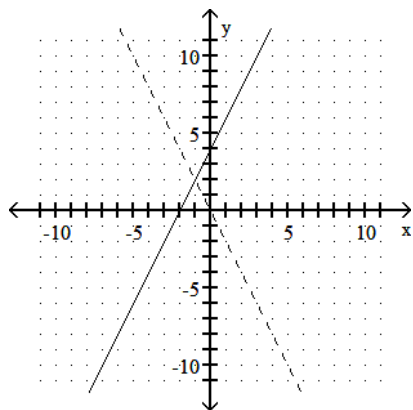
A)



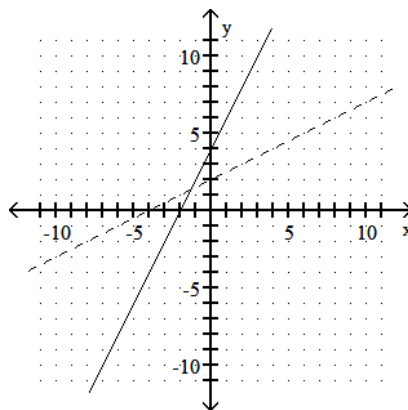
B)



C)



D)



Answer: A

Explanation: A)
B)
C)
D)

Solve for the angle θ , where $0 \leq \theta \leq 2\pi$

98) $\cos^2 \theta = \frac{1}{4}$

98) _____

A) $\theta = 0, \pi, 2\pi$

B) $\theta = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

C) $\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

D) $\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

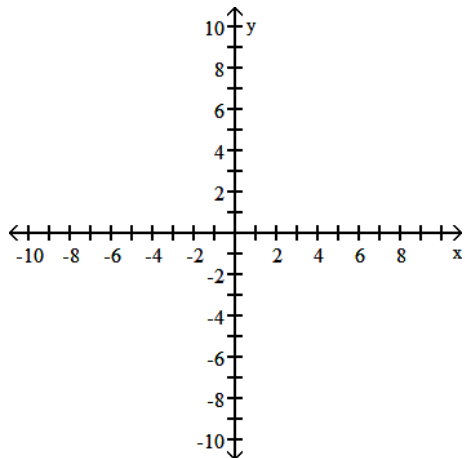
Answer: B

Explanation: A)
B)
C)
D)

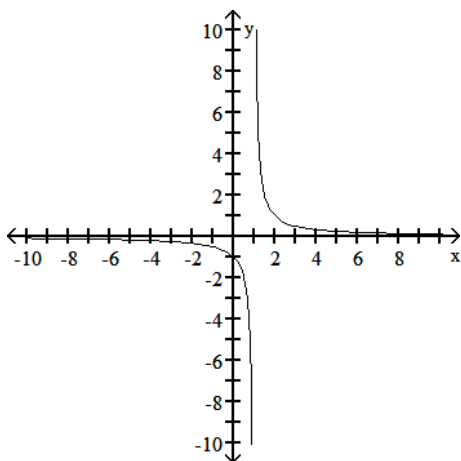
Graph the function.

99) $y = \frac{1}{x+1}$

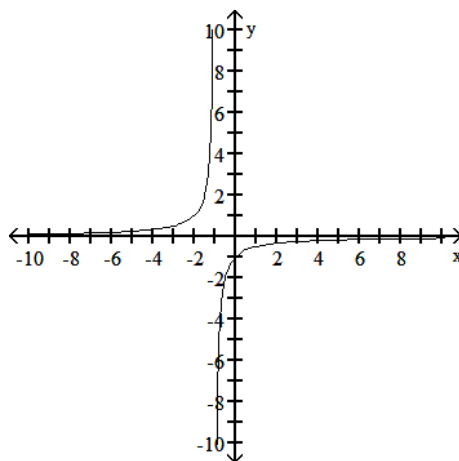
99) _____



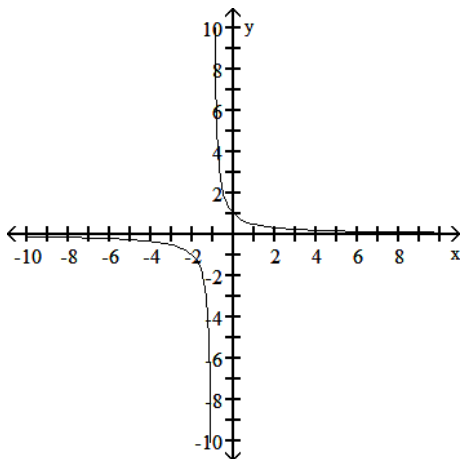
A)



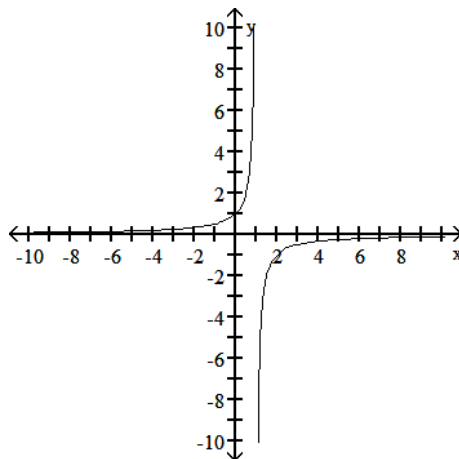
B)



C)



D)



Answer: C

- Explanation:
- A)
 - B)
 - C)
 - D)

Assume that f is an even function, g is an odd function, and both f and g are defined on the entire real line. State whether the combination of functions (where defined) is even or odd.

100) fg

A) Even

B) Odd

100) _____

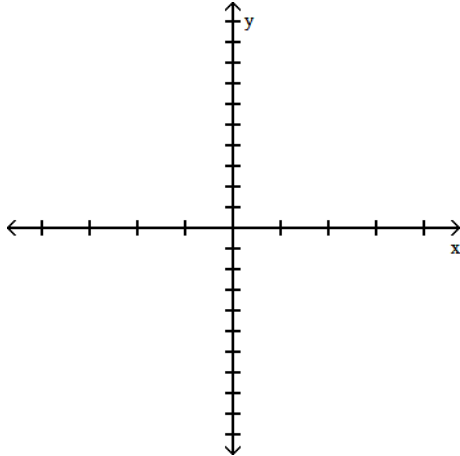
Answer: B

Explanation: A)
B)

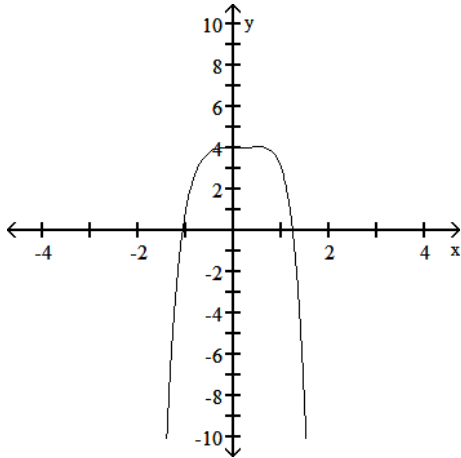
Determine an appropriate viewing window for the given function and use it to display its graph.

101) $f(x) = x^5 - x^4 + x^3 + 4$

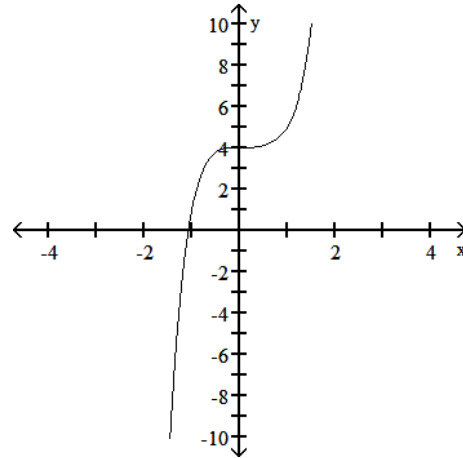
101) _____



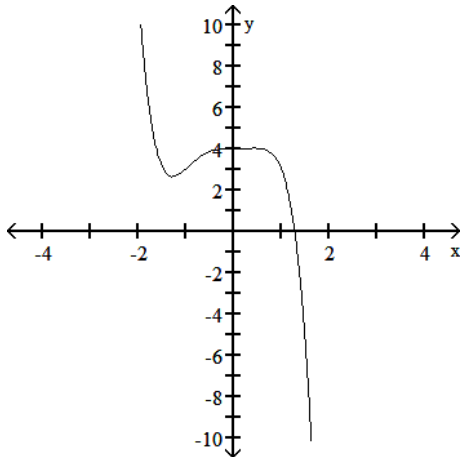
A)



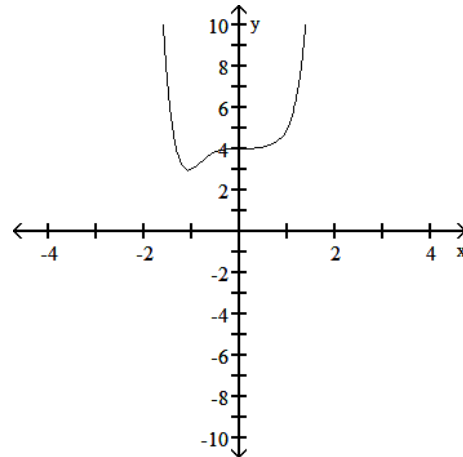
B)



C)



D)



Answer: B

Explanation: A)
B)
C)
D)

Use the laws of exponents to simplify. Do not use negative exponents in your answer.

102) $5^3 \cdot 5 \cdot 5^{-7}$

A) $-\frac{1}{5^4}$

B) 5^3

C) -5^4

D) $\frac{1}{5^3}$

102) _____

Answer: D

Explanation: A)
B)
C)
D)

Express the following logarithm as specified.

103) $\ln(1/25)$ in terms of $\ln 5$

A) $-2 \ln 5$

B) $-\frac{1}{2} \ln 5$

C) $\frac{1}{2} \ln 5$

D) $2 \ln 25$

103) _____

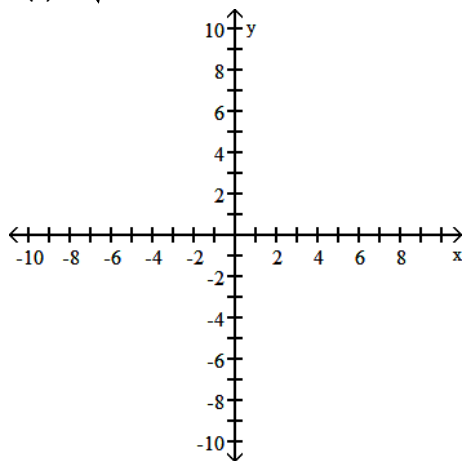
Answer: A

Explanation: A)
B)
C)
D)

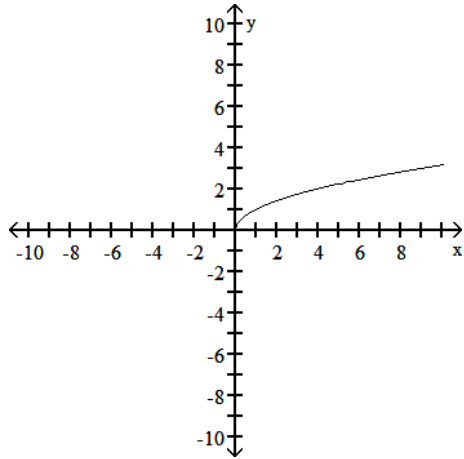
Find the domain and graph the function.

104) $F(x) = \sqrt{-x}$

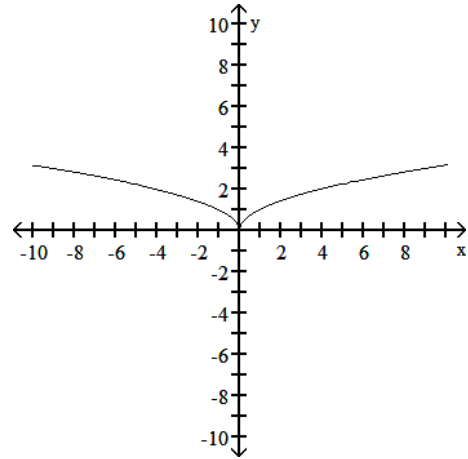
104) _____



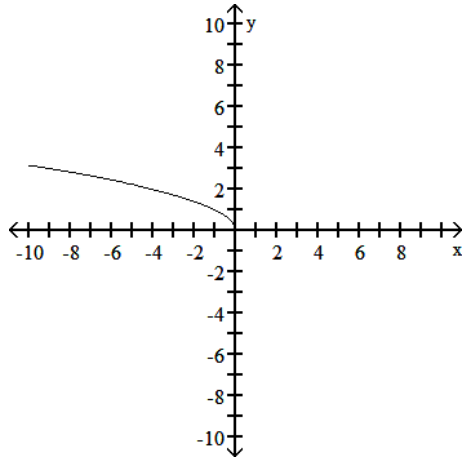
A) $D: [0, \infty)$



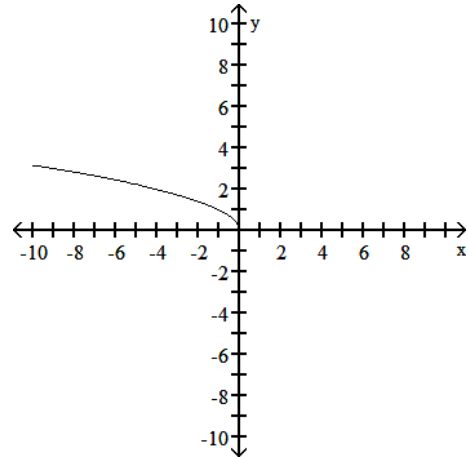
B) $D: (-\infty, \infty)$



C) $D: (-\infty, 0]$



D) $D: (-\infty, 0)$



Answer: C

Explanation: A)
B)
C)
D)

Use the appropriate addition formula to find the exact value of the expression.

105) $\tan\left(\frac{13\pi}{12}\right)$

105) _____

A) $\frac{2 - \sqrt{3}}{4}$

B) $2 + \sqrt{3}$

C) $2 - \sqrt{3}$

D) $\frac{2 + \sqrt{3}}{4}$

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

106) On a circle of radius 24 meters, how long is an arc that subtends a central angle of $\frac{5\pi}{6}$ radians? 106) _____

- A) 120 m B) 20 m C) 4π m D) 20π m

Answer: D

Explanation: A)
B)
C)
D)

Determine if the function is even, odd, or neither.

107) $h(t) = \sqrt{t^2 - 8}$ 107) _____

- A) Even B) Odd C) Neither

Answer: A

Explanation: A)
B)
C)

Use the laws of exponents to simplify. Do not use negative exponents in your answer.

108) $4^8 \cdot 4^4$ 108) _____

- A) 8^{12} B) 4^{32} C) 4^{12} D) 16^{32}

Answer: C

Explanation: A)
B)
C)
D)

Find the exact function value.

109) $\tan^{-1}(1)$ 109) _____

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

Answer: B

Explanation: A)
B)
C)
D)

For

$$f(x) = A \sin\left(\frac{2\pi}{B}(x - C)\right) + D,$$

identify either A, B, C, or D as indicated for the sine function.

110) $y = 2 \sin\left(4x + \frac{\pi}{2}\right)$

Find B.

110) _____

A) 2

B) 4

C) π

D) $\frac{\pi}{2}$

Answer: D

Explanation: A)
B)
C)
D)

Simplify the expression.

111) $e^{\ln 1.4}$

A) 4.06

B) 1.4

C) 0.34

D) 3.81

111) _____

Answer: B

Explanation: A)
B)
C)
D)

Find the domain and range of the inverse of the given function.

112) $f(x) = x^2 + 2, x \geq 0$

A) Domain: $[0, \infty)$; range: $[2, \infty)$

B) Domain: $(-\infty, 0]$; range: $(-\infty, 2]$

C) Domain: $[2, \infty)$; range: $[0, \infty)$

D) Domain and range: all real numbers

112) _____

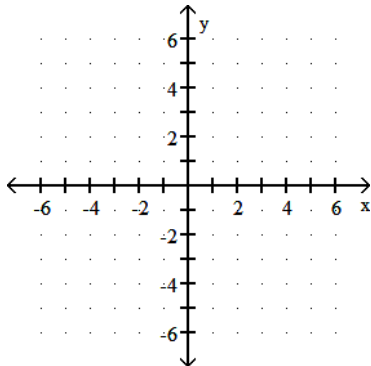
Answer: C

Explanation: A)
B)
C)
D)

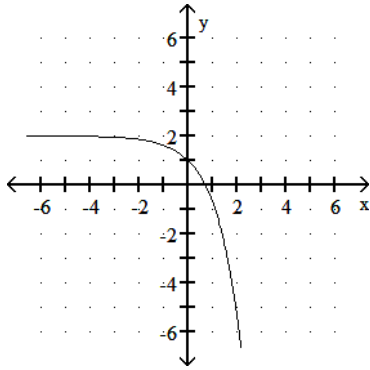
Graph the function.

113) $f(x) = e^x - 2$

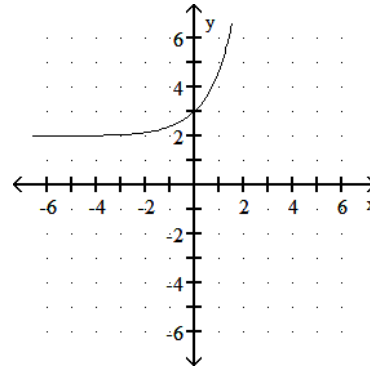
113) _____



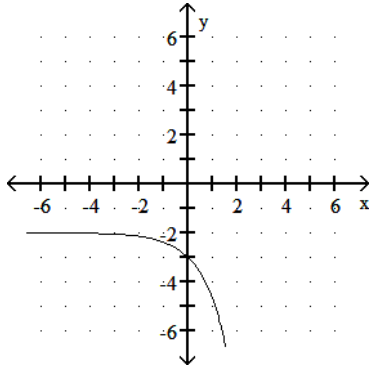
A)



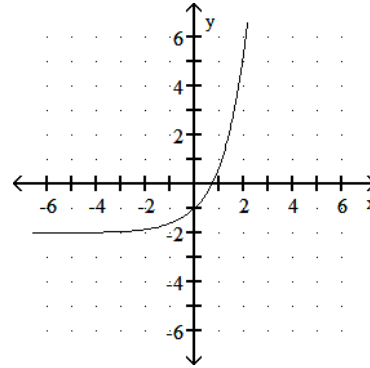
B)



C)



D)



Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

114) Find the amount of interest earned on the following deposit: \$1,000 at 4% compounded annually for 10 years

114) _____

A) \$423.31

B) \$539.45

C) \$480.24

D) \$1480.24

Answer: C

Explanation: A)
B)
C)
D)

115) The variable s is proportional to t , and $s = 50$ when $t = 150$. Determine t when $s = 75$.

115) _____

A) 215

B) 3

C) 300

D) 225

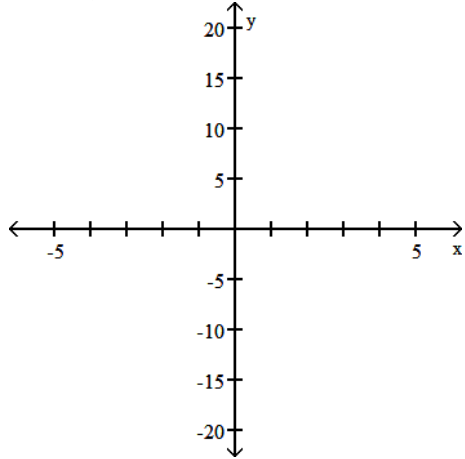
Answer: D

Explanation: A)
B)
C)
D)

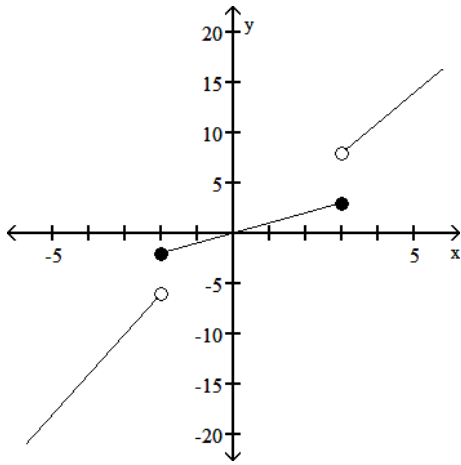
Graph the function.

$$116) f(x) = \begin{cases} 4x + 2, & x < -2 \\ x, & -2 \leq x \leq 3 \\ 3x - 1, & x > 3 \end{cases}$$

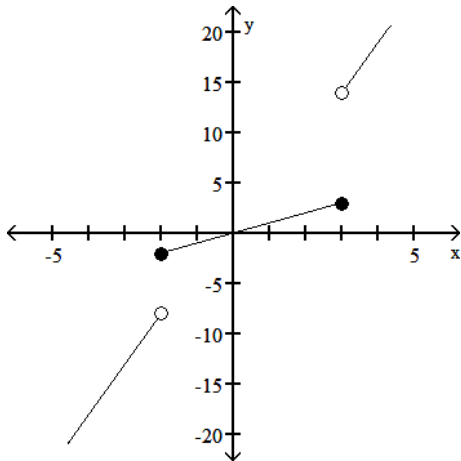
116) _____



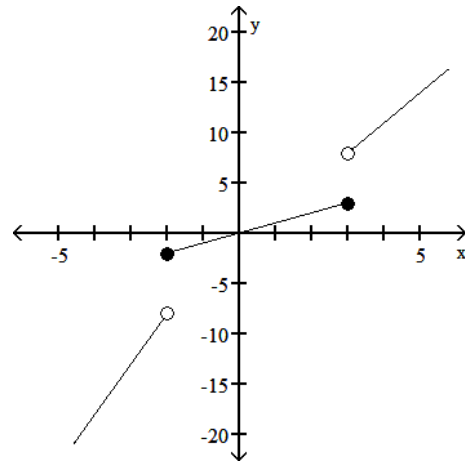
A)



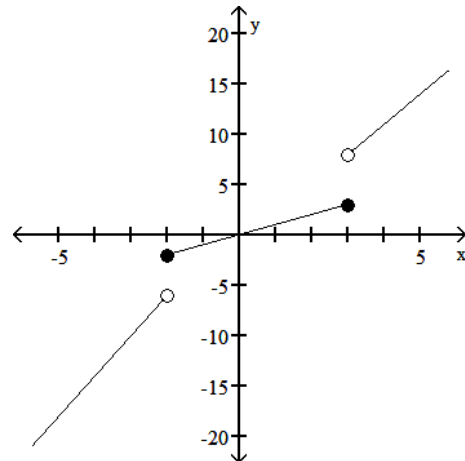
C)



B)



D)



Answer: D

Explanation: A)
B)
C)
D)

Provide an appropriate response.

117) What real numbers x satisfy the equation $\lfloor x \rfloor = \lceil x \rceil$?

- A) $\{x \mid x = 0\}$
- B) $\{x \mid x \in \text{real numbers}\}$
- C) $\{x \mid x \in \text{integers}\}$
- D) \emptyset

117) _____

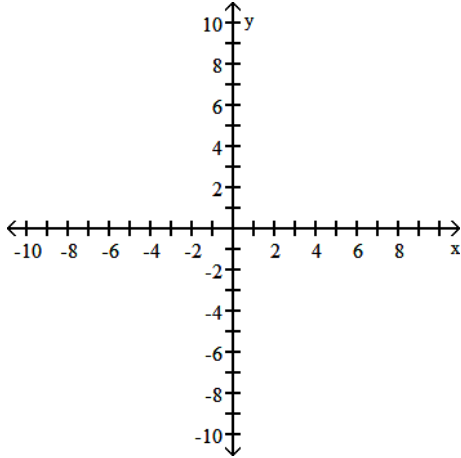
Answer: C

Explanation: A)
B)
C)
D)

Graph the function. Determine the symmetry, if any, of the function.

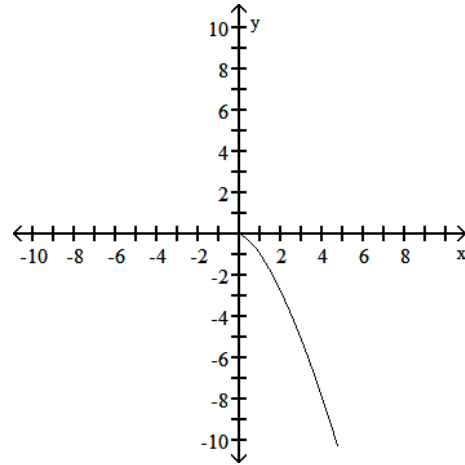
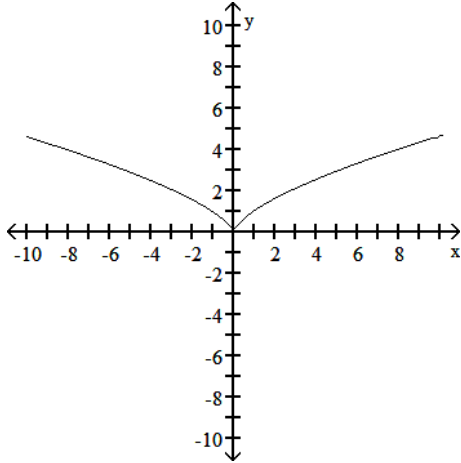
118) $y = -x^{2/3}$

118) _____

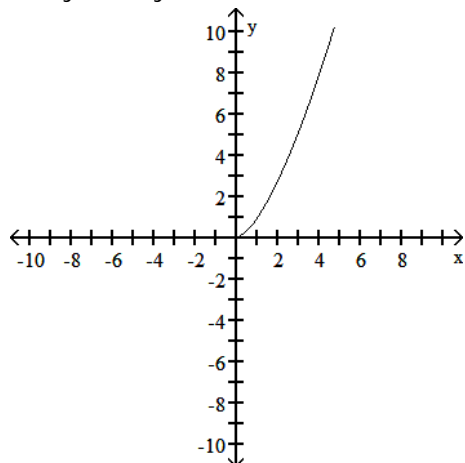


A) Symmetric about the y-axis

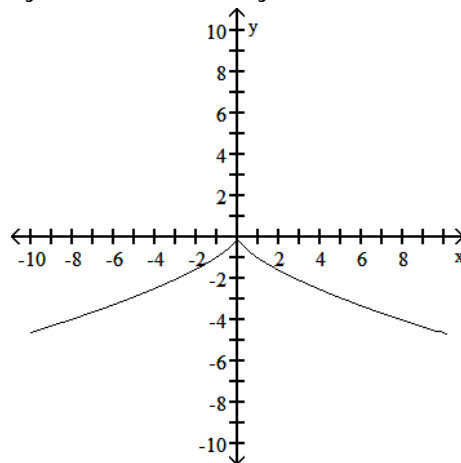
B) No symmetry



C) No symmetry



D) Symmetric about the y-axis



Answer: D

Explanation: A)
B)
C)
D)

Determine if the function is even, odd, or neither.

119) $f(x) = (x - 5)(x + 8)$

A) Even

B) Odd

C) Neither

119) _____

Answer: C

Explanation: A)
B)
C)

120) $g(x) = \frac{-5x}{x^2 + 3}$

A) Even

B) Odd

C) Neither

120) _____

Answer: B

Explanation: A)
B)
C)

Solve the problem.

121) An economist predicts that the buying power $B(x)$ of a dollar x years from now will decrease according to the formula $B(x) = 0.75^x$. How much will today's dollar be worth in 7 years? Round the answer to the nearest cent.

A) \$0.13

B) \$4.30

C) \$0.82

D) \$5.25

121) _____

Answer: A

Explanation: A)
B)
C)
D)

Solve for t or y, as appropriate.

122) $e^{x^2} e^{9x+5} = e^t$

A) $x^2 + 9x + 5$

B) $9x^3 + 5x^2$

C) $\ln(x^2 + 9x + 5)$

D) $x^2 - 9x - 5$

122) _____

Answer: A

Explanation: A)
B)
C)
D)

One of $\sin x$, $\cos x$, and $\tan x$ is given. Find the other two if x lies in the specified interval.

123) $\sin x = -\frac{1}{2}$, $x \text{ in } \left[-\frac{\pi}{2}, 0\right]$

123) _____

A) $\cos x = -\frac{\sqrt{3}}{2}$, $\tan x = -\frac{\sqrt{3}}{3}$

B) $\cos x = -\frac{\sqrt{3}}{2}$, $\tan x = \frac{\sqrt{3}}{3}$

C) $\cos x = \frac{\sqrt{3}}{2}$, $\tan x = -\frac{\sqrt{3}}{3}$

D) $\cos x = \frac{\sqrt{3}}{2}$, $\tan x = \frac{\sqrt{3}}{3}$

Answer: C

Explanation: A)
B)
C)
D)

Find the domain and range for the indicated function.

124) $f(x) = 7$, $g(x) = 7 + \sqrt{x}$; g/f

124) _____

A) D: $x \geq 0$
R: $y \leq 7$

B) D: $x \geq 0$
R: $y \geq 1$

C) D: $x \geq -7$
R: $y \geq 0$

D) D: $x \geq 0$
R: $y \leq 1$

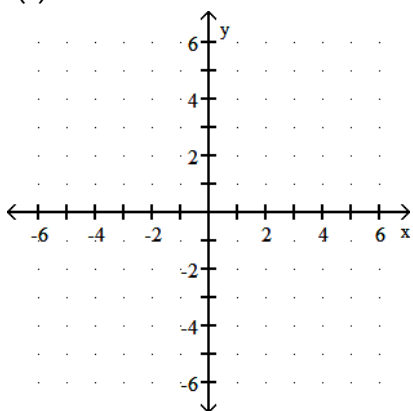
Answer: B

Explanation: A)
B)
C)
D)

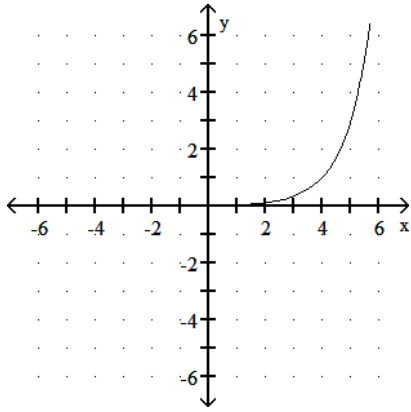
Graph the function.

125) $f(x) = 3(x - 4)$

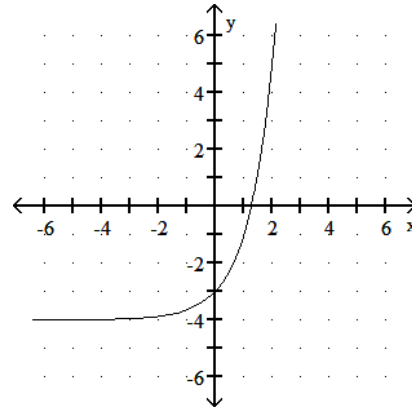
125) _____



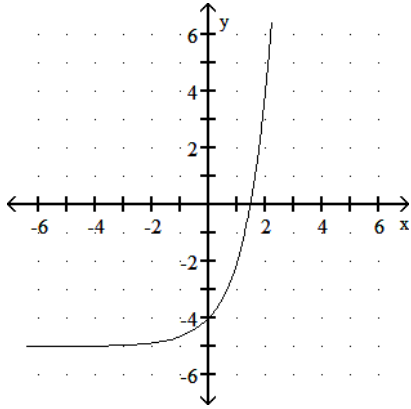
A)



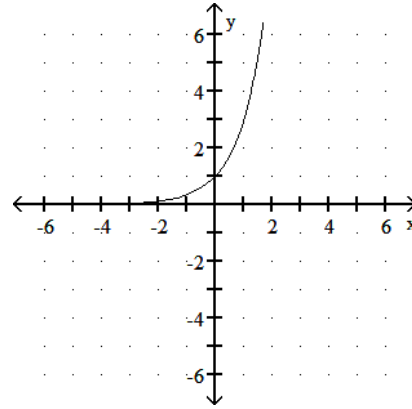
B)



C)



D)



Answer: A

Explanation: A)
B)
C)
D)

Answer Key
 Testname: C1

- 1) B
- 2) C
- 3) A
- 4) D
- 5) C
- 6) D
- 7) C
- 8) D
- 9) B
- 10) B
- 11) C
- 12) A
- 13) A

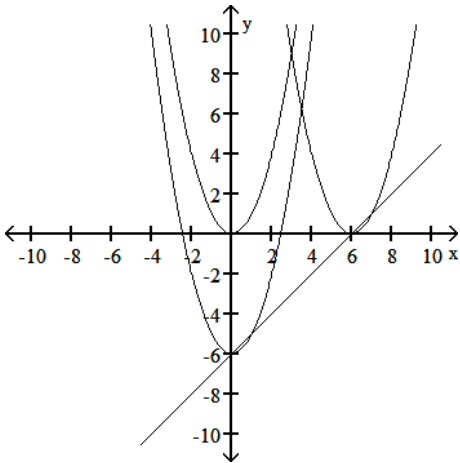
14) If $B = -2\pi$, then $\cos(A + B) = \cos A$ and $\sin(A + B) = \sin A$. Because the period of both of the sine and cosine functions is 2π , if B is replaced by a multiple of 2π the angle sum formulas must produce the same value as the sine or cosine function.

15) $\sec^{-1}(-x) = \cos^{-1}(-1/x) = \pi - \cos^{-1}(1/x) = \pi - \sec^{-1} x$

16) $\sin\left(x - \frac{\pi}{2}\right) = \sin x \cos\left(-\frac{\pi}{2}\right) + \cos x \sin\left(-\frac{\pi}{2}\right)$
 $= \sin x (0) + \cos x (-1)$
 $= 0 - \cos x$
 $= -\cos x$

17) $\cos\left(x + \frac{\pi}{2}\right) = \cos x \cos\frac{\pi}{2} - \sin x \sin\frac{\pi}{2}$
 $= \cos x (0) - \sin x (1)$
 $= 0 - \sin x$
 $= -\sin x$

18)



19) $\cos\left(x - \frac{\pi}{2}\right) = \cos x \cos\left(-\frac{\pi}{2}\right) - \sin x \sin\left(-\frac{\pi}{2}\right)$
 $= \cos x (0) - \sin x (-1)$
 $= 0 + \sin x$
 $= \sin x$

Answer Key
 Testname: C1

$$20) \tan(A - B) = \frac{\sin(A - B)}{\cos(A - B)} = \frac{\sin A \cos B - \sin B \cos A}{\cos A \cos B + \sin A \sin B} =$$

$$\frac{(\cos A \cos B)^{-1}(\sin A \cos B - \sin B \cos A)}{(\cos A \cos B)^{-1}(\cos A \cos B + \sin A \sin B)} = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

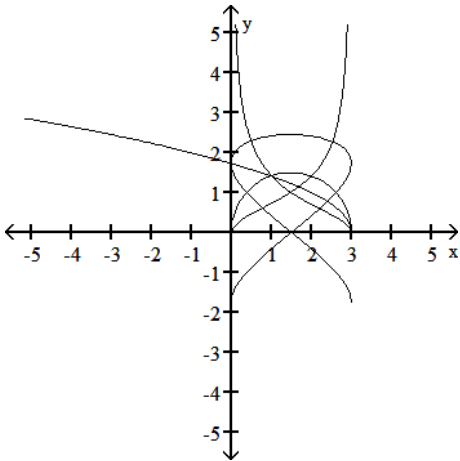
$$21) \sin\left(x + \frac{\pi}{2}\right) = \sin x \cos \frac{\pi}{2} + \cos x \sin \frac{\pi}{2}$$

$$= \sin x (0) + \cos x (1)$$

$$= 0 + \cos x$$

$$= \cos x$$

22)



$$23) \sin(A - B)$$

$$= \sin(A + (-B))$$

$$= \sin A \cos(-B) + \cos A \sin(-B)$$

$$= \sin A \cos B - \cos A \sin B$$

24) When $y = \cos 2x$ is at a maximum point, which is at any multiple of π , $y = \sec 2x$ is a minimum point. Similarly, when $\cos(2x)$ is at a minimum point, which is at any odd multiple of $\frac{\pi}{2}$, $y = \sec 2x$ is at a maximum point.

25) When $y = \sin \frac{x}{2}$ is at a maximum point, which is at $x = (4n + 1)\pi$ for all integers n , $y = \csc \frac{x}{2}$ is at a minimum point.

Similarly, when $y = \sin \frac{x}{2}$ is at a minimum point, which is at $x = (4n - 1)\pi$ for all integers n , $y = \csc \frac{x}{2}$ is at a maximum point.

- 26) A
- 27) B
- 28) C
- 29) D
- 30) B
- 31) A
- 32) B
- 33) C
- 34) B
- 35) A
- 36) B
- 37) C

Answer Key
Testname: C1

- 38) A
- 39) B
- 40) A
- 41) C
- 42) D
- 43) C
- 44) A
- 45) C
- 46) B
- 47) C
- 48) D
- 49) D
- 50) A
- 51) B
- 52) C
- 53) C
- 54) B
- 55) B
- 56) B
- 57) A
- 58) B
- 59) D
- 60) B
- 61) C
- 62) B
- 63) A
- 64) D
- 65) C
- 66) B
- 67) A
- 68) A
- 69) B
- 70) A
- 71) D
- 72) C
- 73) A
- 74) C
- 75) D
- 76) D
- 77) D
- 78) A
- 79) D
- 80) B
- 81) B
- 82) D
- 83) C
- 84) D
- 85) C
- 86) B
- 87) D

Answer Key

Testname: C1

- 88) C
- 89) C
- 90) A
- 91) C
- 92) C
- 93) D
- 94) D
- 95) B
- 96) B
- 97) A
- 98) B
- 99) C
- 100) B
- 101) B
- 102) D
- 103) A
- 104) C
- 105) C
- 106) D
- 107) A
- 108) C
- 109) B
- 110) D
- 111) B
- 112) C
- 113) D
- 114) C
- 115) D
- 116) D
- 117) C
- 118) D
- 119) C
- 120) B
- 121) A
- 122) A
- 123) C
- 124) B
- 125) A