

AP CALCULUS
SUMMER ASSIGNMENT
PART II

Read Section 1.1 - 1.3, 1.5 & 1.6
BEFORE starting this section

Name: _____

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

A particle moves from A to B in the coordinate plane. Find the increments Δx and Δy in the particle's coordinates.

1) A(-5.0, -0.5), B(5.7, 7.5)

A) $\Delta x = 10.7; \Delta y = 8$

C) $\Delta x = -12.5; \Delta y = -6.2$

B) $\Delta x = -4.5; \Delta y = -1.8$

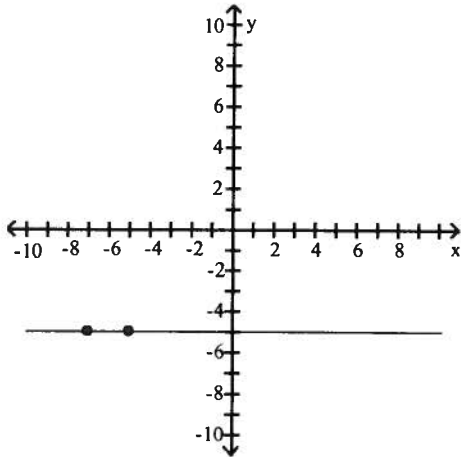
D) $\Delta x = -4.5; \Delta y = -8$

1) _____

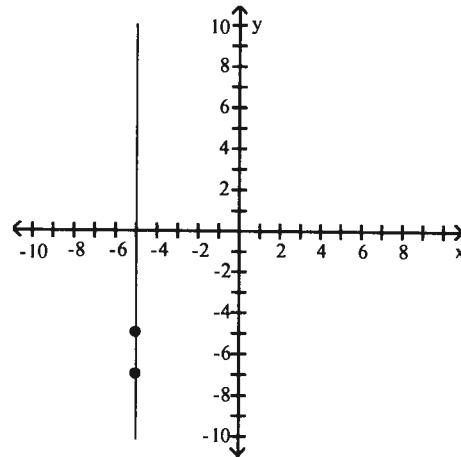
Plot the points and find the slope (if any) of the line they determine.

2) A(-5, -5), B(-5, -7)

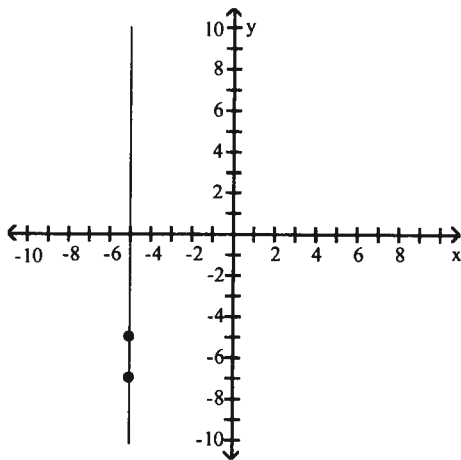
A) $m = 0$



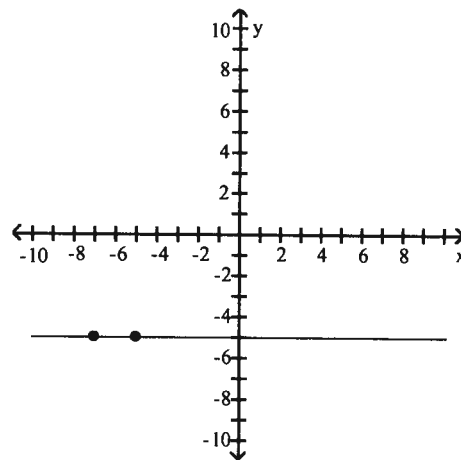
B) m is undefined.



C) $m = 0$



D) m is undefined.



Find an equation for the vertical line and the horizontal line through the given point.

3) $(\pi, 0)$

A) $x = 0$
 $y = -\pi$

B) $x = \pi$
 $y = 0$

C) $x = 0$
 $y = \pi$

D) $x = -\pi$
 $y = 0$

3) _____

Write an equation for the line described.

4) Passes through $(-7, -6)$ and has slope 0

A) $y = -7$

B) $x = -7$

C) $y = -6$

D) $x = -6$

4) _____

5) Passes through $(3, -1)$ and $(-2, 7)$

A) $y = \frac{4}{9}x + \frac{55}{9}$

B) $y = -\frac{4}{9}x + \frac{55}{9}$

C) $y = -\frac{8}{5}x + \frac{19}{5}$

D) $y = \frac{8}{5}x + \frac{19}{5}$

5) _____

Find the slope and the y-intercept of the line.

6) $2x - 2y = -12$

A) $m = 0$; y-intercept: $(0, 2)$

B) $m = 1$; y-intercept: $(0, 6)$

C) $m = -2$; y-intercept: $(0, -6)$

D) $m = 1$; y-intercept: $(0, -12)$

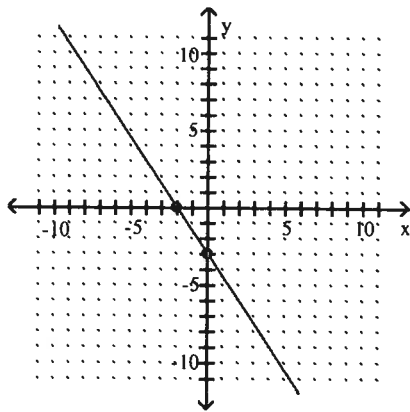
6) _____

Graph the line.

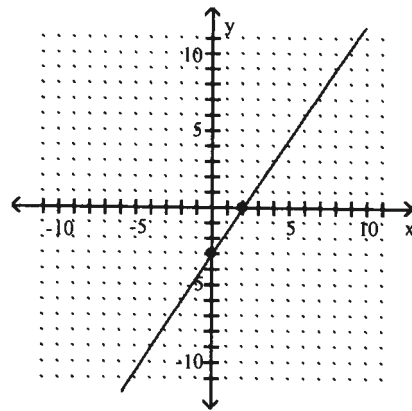
7) $\frac{3}{2}x - y = 3$

7) _____

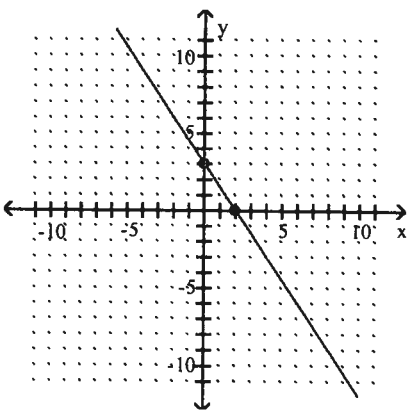
A)



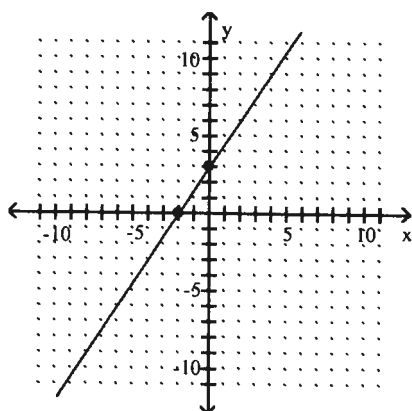
B)



C)



D)



Solve the problem.

8) The paired data below consist of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters). Find the linear regression equation for the data.

8) _____

Temp (x)	62	76	50	51	71	46	51	44	79
Growth (y)	36	39	50	13	33	33	17	6	16

A) $y = 0.122x + 7.30$

B) $y = 0.211x + 14.6$

C) $y = -0.211x - 14.6$

D) $y = -0.112x + 7.30$

Find the domain and range.

9) $y = \sqrt{9 + x}$

9) _____

A) Domain: $[-9, \infty)$; Range: $[0, \infty)$

B) Domain: $(-\infty, \infty)$; Range: $y \geq [-9, \infty)$

C) Domain: $[0, \infty)$; Range: $(-\infty, \infty)$

D) Domain: $(-\infty, \infty)$; Range: $(-\infty, \infty)$

10) $f(x) = \frac{7}{4 - x}$

10) _____

A) Domain: $(-\infty, \infty)$; Range: $(-\infty, 0) \cup (0, \infty)$

B) Domain: $(-\infty, 4) \cup (4, \infty)$; Range: $(-\infty, \infty)$

C) Domain: $(-\infty, \infty)$; Range: $(-\infty, \infty)$

D) Domain: $(-\infty, 4) \cup (4, \infty)$; Range: $(-\infty, 0) \cup (0, \infty)$

Graph the function on your calculator to determine the domain and range from the graph.

11) $y = \sqrt{16 - x^2}$

11) _____

A) Domain: $[-4, 4]$; Range: $[0, 4]$

B) Domain: $[0, \infty)$; Range: $(-\infty, \infty)$

C) Domain: $(-\infty, \infty)$; Range: $(0, 4)$

D) Domain: $(-4, 4)$; Range: $(-4, 4)$

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

12) $y = 9x^5 - 7x^3$

12) _____

A) Even

B) Odd

C) Neither

13) $y = -8x^4 + 2x - 5$

A) Even

B) Odd

C) Neither

13) _____

14) $y = \frac{3}{x^2 - 6}$

A) Even

B) Odd

C) Neither

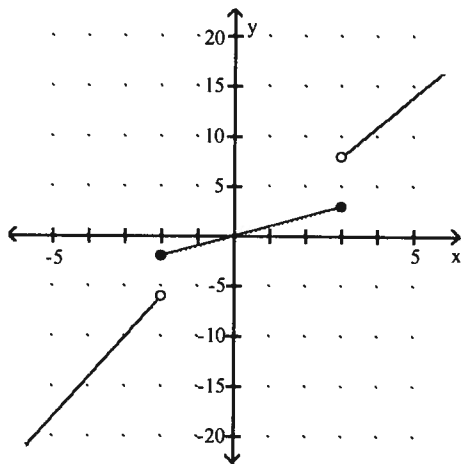
14) _____

Graph the piecewise-defined function.

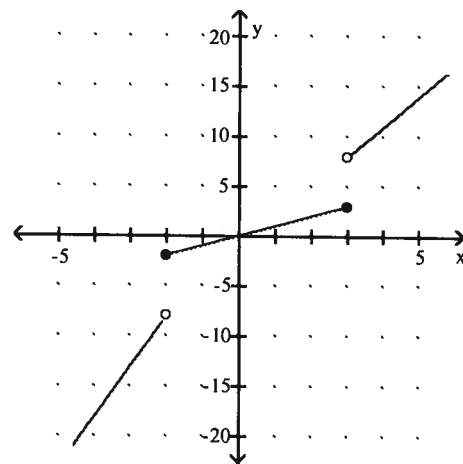
15) $f(x) = \begin{cases} 4x + 2, & x < -2 \\ x, & -2 \leq x \leq 3 \\ 3x - 1, & x > 3 \end{cases}$

15) _____

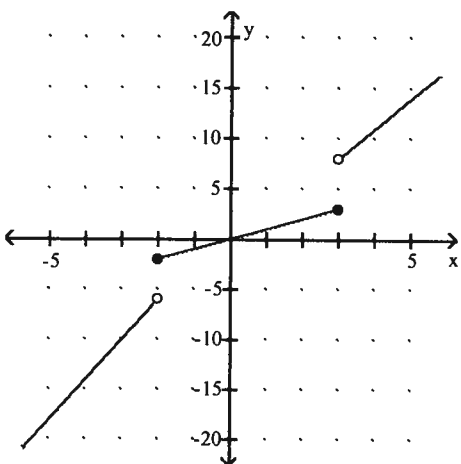
A)



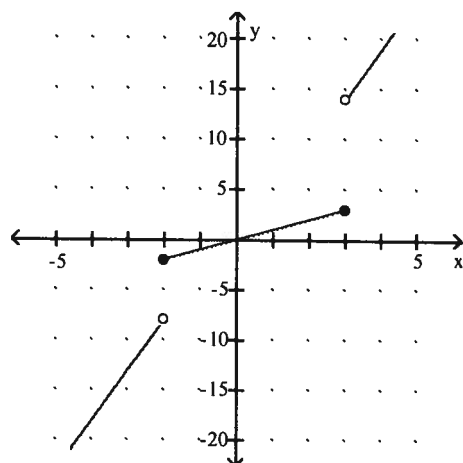
B)



C)

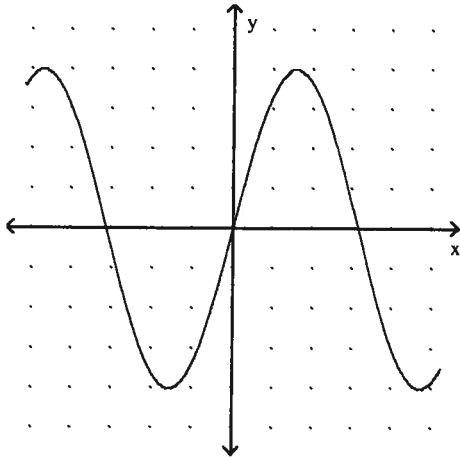


D)



Use the vertical line test to determine if the graph is a graph of a function.

16)



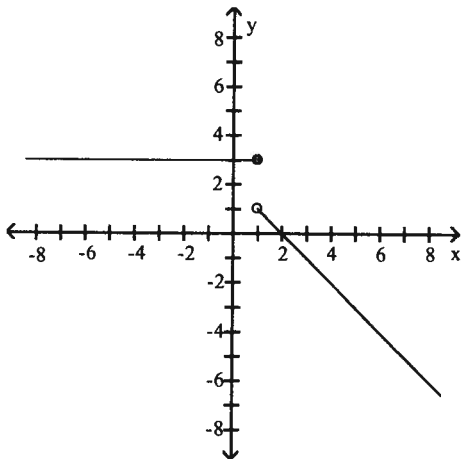
16) _____

A) No

B) Yes

Find a formula for the function graphed.

17)



17) _____

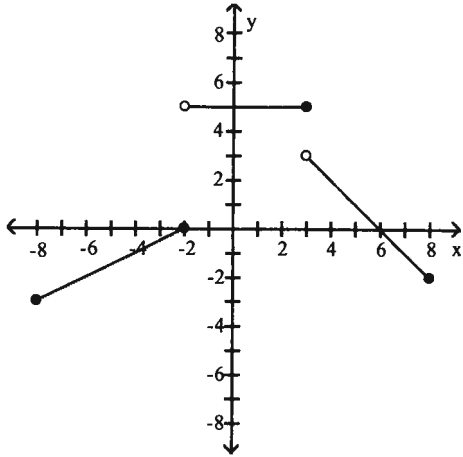
A) $f(x) = \begin{cases} 3, & x < 1 \\ x - 2, & x \geq 1 \end{cases}$

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

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

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

18)



$$\text{A) } f(x) = \begin{cases} \frac{1}{2}x + 1, & -8 \leq x \leq -2 \\ 5, & -2 < x < 3 \\ 6 - x, & 3 \leq x \leq 8 \end{cases}$$

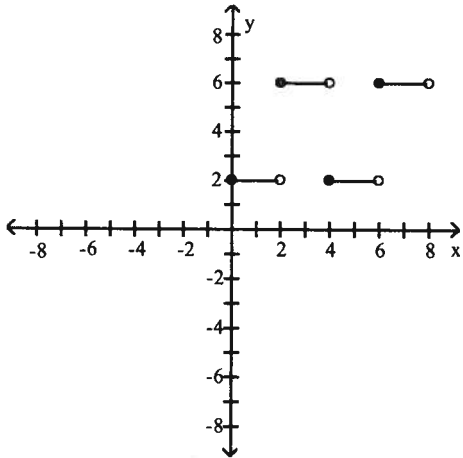
$$\text{B) } f(x) = \begin{cases} -\frac{1}{2}x + 1, & -8 \leq x \leq -2 \\ 5, & -2 < x \leq 3 \\ x - 6, & 3 < x \leq 8 \end{cases}$$

$$\text{C) } f(x) = \begin{cases} \frac{1}{2}x + 1, & -8 < x \leq -2 \\ 5, & -2 < x \leq 3 \\ 6 - x, & 3 < x < 8 \end{cases}$$

$$\text{D) } f(x) = \begin{cases} \frac{1}{2}x + 1, & -8 \leq x \leq -2 \\ 5, & -2 < x \leq 3 \\ 6 - x, & 3 < x \leq 8 \end{cases}$$

18) _____

19)



$$\text{A) } f(x) = \begin{cases} 2, & 0 \leq x < 6 \\ 6, & 2 \leq x < 8 \end{cases}$$

$$\text{B) } f(x) = \begin{cases} 2, & 0 \leq x \leq 2 \\ 6, & 2 < x \leq 4 \\ 2, & 4 < x \leq 6 \\ 6, & 6 < x \leq 8 \end{cases}$$

$$\text{C) } f(x) = \begin{cases} 6, & 0 \leq x < 6 \\ 2, & 2 \leq x < 8 \end{cases}$$

$$\text{D) } f(x) = \begin{cases} 2, & 0 \leq x < 2 \\ 6, & 2 \leq x < 4 \\ 2, & 4 \leq x < 6 \\ 6, & 6 \leq x < 8 \end{cases}$$

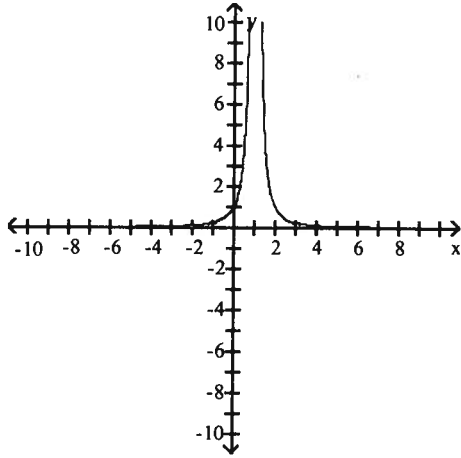
19) _____

Graph the function.

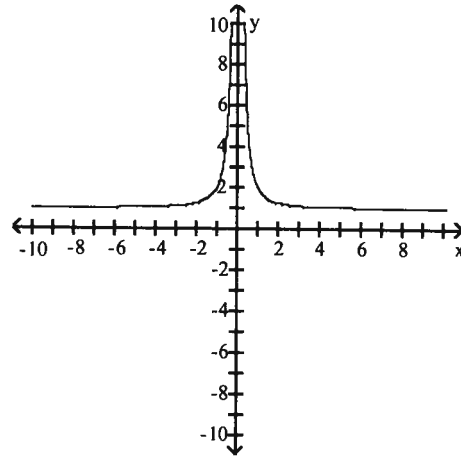
20) $y = \frac{1}{x^2} - 1$

20) _____

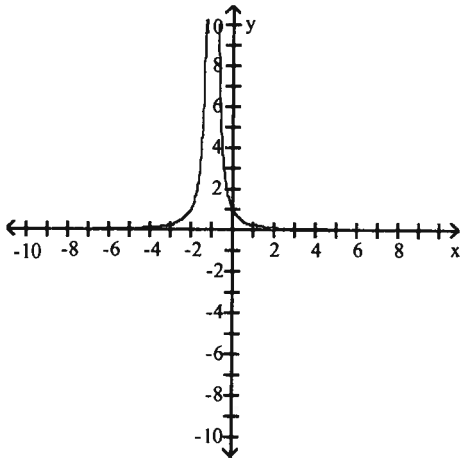
A)



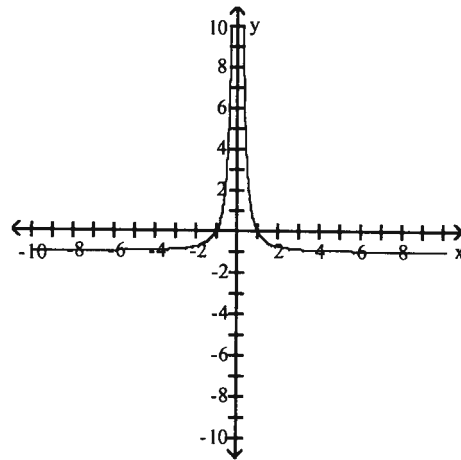
B)



C)



D)



Solve the problem.

21) If $f(x) = 4x^2 + 4x + 6$ and $g(x) = 4x - 3$, find $g(f(x))$.

21) _____

A) $4x^2 + 4x + 3$

B) $4x^2 + 16x + 21$

C) $16x^2 + 16x + 21$

D) $16x^2 + 16x + 27$

22) If $f(x) = 5x + 1$ and $g(x) = -7x^2 - 8x - 6$, find $g(f(3))$.

A) -464

B) -246

C) -254

D) -1926

22) _____

23) If $(f \circ g)(x) = x + 2$ and $g(x) = \sqrt{x - 1}$, find $f(x)$.

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

B) $f(x) = x^2$

C) $f(x) = x^2 + 3$

D) $f(x) = x^2 + 2x + 3$

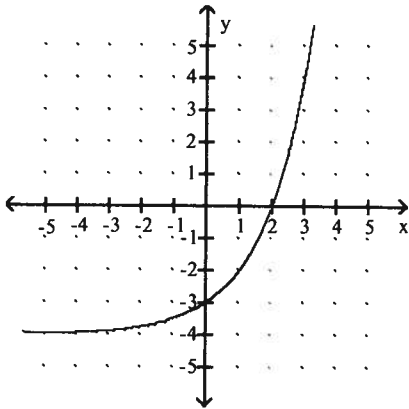
23) _____

Graph the exponential function.

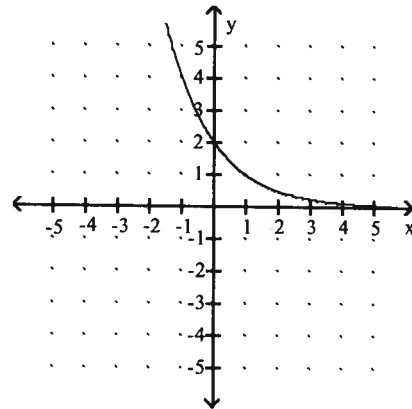
24) $y = 2 \cdot 0.5^x - 4$

24) _____

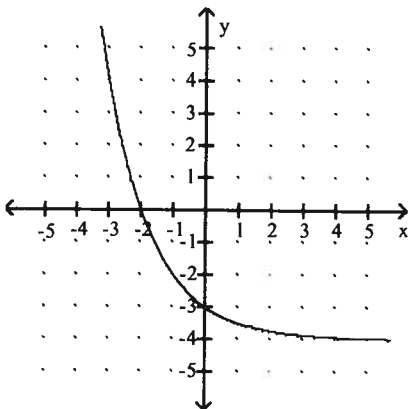
A)



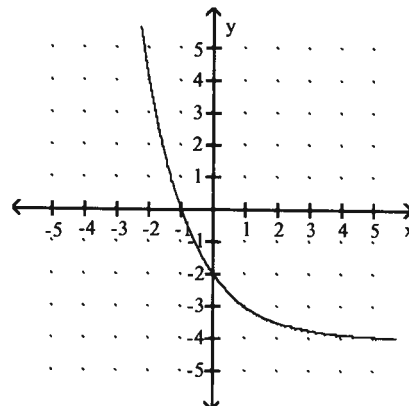
B)



C)



D)



Rewrite the exponential expression to have the indicated base.

25) 27^{2x} ; base 3

A) 3^{7x}

B) 3^{12x}

C) 3^{-6x}

D) 3^{6x}

25) _____

Use your grapher to find the zero of the function. Round your answer to three decimal places.

26) $f(x) = e^x - 7$

A) 1.845

B) 3.246

C) 1.946

D) 2.056

26) _____

Solve the problem.

27) A certain radioactive isotope has a half-life of approximately 1850 years. How many years to the nearest year would be required for a given amount of this isotope to decay to 40% of that amount?

A) 1363 years

B) 1110 years

C) 2406 years

D) 2446 years

27) _____

28) The population of a small country increases according to the function $B = 2,000,000e^{0.04t}$, where t is measured in years. How many people will the country have after 8 years?

A) 2,754,256

B) 2,278,869

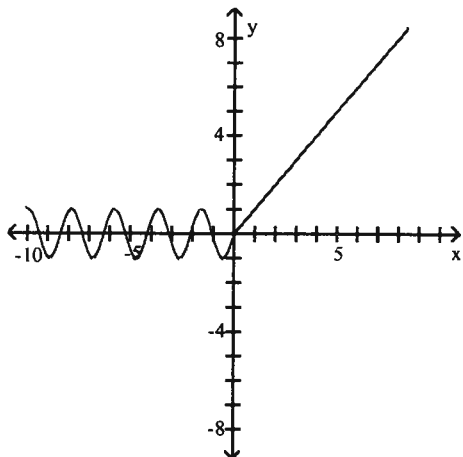
C) 989,700

D) 4,178,592

28) _____

Determine if the function is one-to-one.

29)



A) Yes

B) No

29) _____

Determine if the function has an inverse function.

30) $y = x^3 - 3x + 5$

A) Yes

B) No

30) _____

Find the inverse of the function.

31) $f(x) = 5x^3 - 1$

A) Not a one-to-one function

B) $f^{-1}(x) = \sqrt[3]{\frac{x-1}{5}}$

C) $f^{-1}(x) = \sqrt[3]{\frac{x}{5}} + 1$

D) $f^{-1}(x) = \sqrt[3]{\frac{x+1}{5}}$

31) _____

Solve the equation.

32) $(8.76)^t = 9$

A) $t = \frac{\ln 8}{\ln 8.76}$

B) $t = \frac{9}{\ln 8.76}$

C) $t = \frac{\ln 9}{\ln 8.76}$

D) $t = -\frac{\ln 9}{\ln 8.76}$

32) _____

33) $e^{0.54t} = 20$

A) $t = 0.54 \ln 20$

B) $t = \frac{\ln 21}{0.54}$

C) $t = \frac{\ln 20}{0.54}$

D) $t = \frac{0.54}{\ln 20}$

33) _____

34) $2^x + 2^{-x} = 3$

A) $x = \log_2 \left(\frac{3\sqrt{5}}{2} \right)$

C) $x = \log_2 \left(\frac{5 \pm \sqrt{7}}{4} \right)$

B) $x = \log_2 \left(\frac{3 \pm \sqrt{5}}{2} \right)$

D) $x = \log_2 \left(\frac{\sqrt{5}}{2} \right)$

34) _____

35) $\ln y = 9t - 8$; Solve for y.

A) $y = 2^{11t}$

B) $y = -e^{10t - 7}$

C) $y = e^{9t - 8}$

D) $y = e^{-9t + 8}$

35) _____

36) $\ln y = 6t - 5$; Solve for y.

A) $y = e^{6t - 5}$

B) $y = -e^{7t - 4}$

C) $y = 2^{8t}$

D) $y = e^{-6t + 5}$

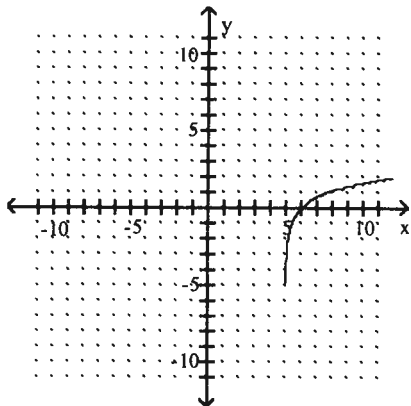
36) _____

Graph the function.

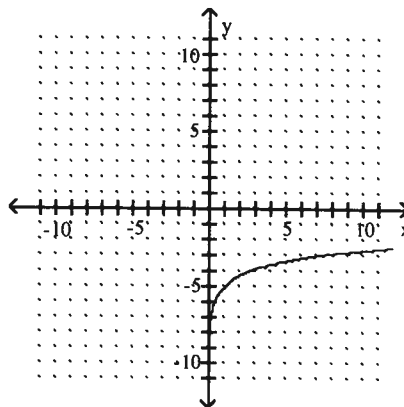
37) $f(x) = \ln(x + 5)$

37) _____

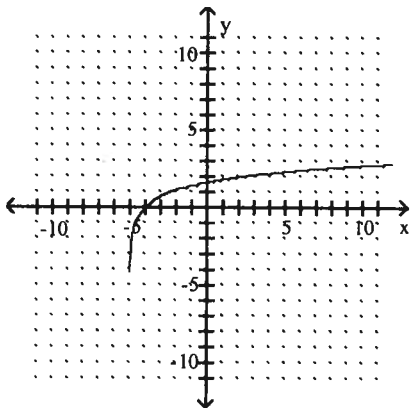
A)



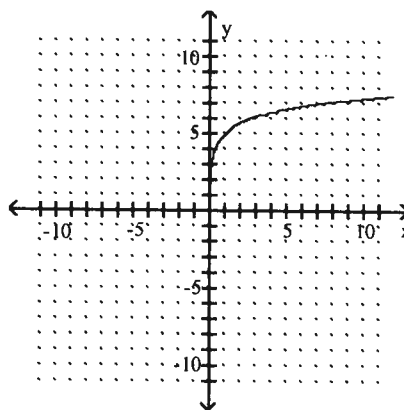
B)



C)



D)



Solve the problem.

38) A college student invests \$11,000 in an account paying 8% per year compounded annually. In how many years will the amount quadruple? 38) _____

A) 19.5 years

B) 22.2 years

C) 20.9 years

D) 18 years

Find the requested function value meeting all of the given conditions.

39) $\cos \theta = -\frac{1}{2}$ and $\sin \theta < 0$; Find $\csc \theta$.

39) _____

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

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

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

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

40) $\tan \theta = -1$ and $\sin \theta > 0$; Find $\cos \theta$.

40) _____

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

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

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

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