AP Calculus
Summer Homework
Part 2

Name_____

Score _____

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

Find the distance $d(P_1, P_2)$ between the points P_1 and P_2.

1) $P_1 = (3, 6)$; $P_2 = (-4, -2)$ 1) _____

A) 1 B) $\sqrt{113}$ C) 56 D) $\sqrt{15}$

Solve the problem.

2) Find all values of k so that the given points are $\sqrt{29}$ units apart. 2) _____
(-5, 5), (k, 0)

A) 7 B) 3, 7 C) -3, -7 D) -7

Find the midpoint of the line segment joining the points P_1 and P_2.

3) $P_1 = (5, -8)$; $P_2 = (-1, -6)$ 3) _____

A) $(6, -2)$ B) $(2, -7)$ C) $(3, -1)$ D) $(4, -14)$

List the intercepts for the graph of the equation.

4) $4x^2 + 16y^2 = 64$ 4) _____

A) (-2, 0), (-4, 0), (4, 0), (2, 0) B) (-4, 0), (0, -2), (0, 2), (4, 0)
C) (-16, 0), (0, -4), (0, 4), (16, 0) D) (-4, 0), (-16, 0), (16, 0), (4, 0)

Determine whether the graph of the equation is symmetric with respect to the x-axis, the y-axis, and/or the origin.

5) $x^2 + y - 81 = 0$ 5) _____

A) x-axis
B) y-axis
C) origin
D) x-axis, y-axis, origin
E) none

6) $y = -8x^3 + 6x$ 6) _____

A) y-axis
B) x-axis
C) origin
D) x-axis, y-axis, origin
E) none

Find the function.

7) Find the function that is finally graphed after the following transformations are applied to the graph of $y = |x|$. The graph is shifted right 3 units, stretched by a factor of 3, shifted vertically down 2 units, and finally reflected across the x-axis. 7) _____

A) $y = -(3|x - 3| - 2)$ B) $y = 3|-x - 3| - 2$
C) $y = -3|x - 3| - 2$ D) $y = -(3|x + 3| - 2)$

Use a graphing utility to approximate the real solutions, if any, of the equation rounded to two decimal places.

8) $x^3 - 6x + 3 = 0$ 8) _____

A) {-0.48}
B) {2.15, 0.52, -2.67}
C) {2.67, -0.52, -2.15}
D) no solution

Find the slope of the line containing the two points.

9) (8, -7); (-3, 8) 9) _____

A) $-\frac{11}{15}$ B) $\frac{15}{11}$ C) $-\frac{15}{11}$ D) $\frac{11}{15}$

Find an equation for the line with the given properties.

10) Slope undefined; containing the point $\left(-\frac{4}{7}, 3\right)$ 10) _____

A) $y = 3$ B) $x = 3$ C) $x = -\frac{4}{7}$ D) $y = -\frac{4}{7}$

Find the slope-intercept form of the equation of the line with the given properties.

11) Slope = 0; containing the point (-9, -7) 11) _____

A) $y = -9$ B) $y = -7$ C) $x = -9$ D) $x = -7$

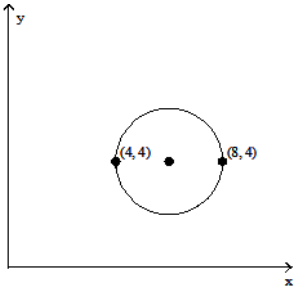
Find an equation for the line with the given properties.

12) Perpendicular to the line $y = 2x - 4$; containing the point (1, -2) 12) _____

A) $y = \frac{1}{2}x - \frac{3}{2}$ B) $y = 2x - \frac{3}{2}$ C) $y = -\frac{1}{2}x - \frac{3}{2}$ D) $y = -2x - \frac{3}{2}$

Write the standard form of the equation of the circle.

13) 13) _____



A) $(x - 6)^2 + (y - 4)^2 = 2$
B) $(x - 6)^2 + (y - 4)^2 = 4$
C) $(x + 6)^2 + (y + 4)^2 = 4$
D) $(x + 6)^2 + (y + 4)^2 = 2$

Find the value for the function.

14) Find f(-x) when $f(x) = \frac{x}{x^2 + 4}$. 14) _____

A) $\frac{-x}{x^2 - 4}$ B) $\frac{x}{-x^2 + 4}$ C) $\frac{-x}{-x^2 + 4}$ D) $\frac{-x}{x^2 + 4}$

15) Find $f(x + h)$ when $f(x) = \frac{-3x + 7}{8x + 9}$. 15) _____

A) $\frac{-3x - 3h + 7}{8x + 8h + 9}$ B) $\frac{-3x + 4h}{8x + 17h}$ C) $\frac{-3x - 3h + 7}{8x + 9}$ D) $\frac{-3x + 7h}{8x + 9h}$

Solve the problem.

16) If $f(x) = 8x^3 + 7x^2 - x + C$ and $f(-2) = 1$, what is the value of C? 16) _____

A) C = -1 B) C = -93 C) C = 35 D) C = -37

17) If $f(x) = \frac{x - B}{x - A}$, $f(9) = 0$, and $f(4)$ is undefined, what are the values of A and B? 17) _____

A) A = -4, B = -9 B) A = -9, B = -4 C) A = 9, B = 4 D) A = 4, B = 9

18) If a rock falls from a height of 30 meters on Earth, the height H (in meters) after x seconds is approximately 18) _____

$H(x) = 30 - 4.9x^2$.

What is the height of the rock when x = 2 seconds? Round to the nearest hundredth, if necessary.

A) 49.6 m B) 20.2 m C) 10.4 m D) 10.8 m

Find the domain of the function.

19) $f(x) = x^2 + 8$ 19) _____

A) $\{x | x > -8\}$ B) $\{x | x \neq -8\}$

C) all real numbers D) $\{x | x \geq -8\}$

20) $g(x) = \frac{3x}{x^2 - 64}$ 20) _____

A) $\{x | x \neq 0\}$ B) all real numbers

C) $\{x | x > 64\}$ D) $\{x | x \neq -8, 8\}$

21) $\frac{x}{\sqrt{x - 4}}$ 21) _____

A) all real numbers B) $\{x | x > 4\}$

C) $\{x | x \geq 4\}$ D) $\{x | x \neq 4\}$

Find and simplify the difference quotient of f, $\frac{f(x + h) - f(x)}{h}$, $h \neq 0$, for the function.

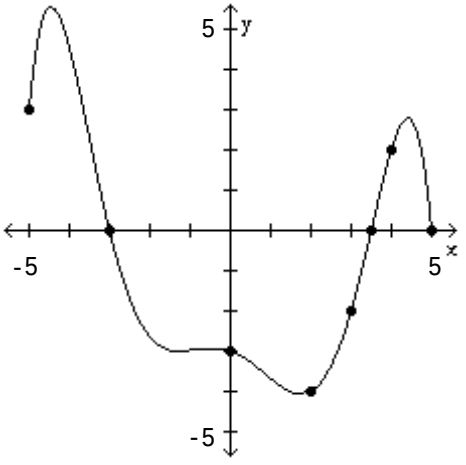
22) $f(x) = x^2 + 6x + 7$ 22) _____

A) $2x + h + 7$ B) $\frac{2x^2 + 2x + 2xh + h^2 + h + 14}{h}$

C) 1 D) $2x + h + 6$

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

23) For what numbers x is f(x) > 0? 23) _____



A) [-5, -3), (3.5, 5) B) (-3, ∞) C) (-∞ -3) D) (-3, 3.5)

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

24) $f(x) = 3x^4 - x^2$ 24) _____

A) even B) odd C) neither

25) $f(x) = \frac{x}{x^2 + 4}$ 25) _____

A) even B) odd C) neither

Use a graphing utility to graph the function over the indicated interval and approximate any local maxima and local minima. Determine where the function is increasing and where it is decreasing. If necessary, round answers to two decimal places.

26) $f(x) = x^3 - 4x^2 + 6;\ (-1, 4)$ 26) _____

A) local maximum at (2.67, -3.48)
local minimum at (0, 6)
increasing on (-1, 0) and (2.67, 4)
decreasing on (0, 2.67)

B) local maximum at (2.67, -3.48)
local minimum at (0, 6)
increasing on (0, 2.67)
decreasing on (-1, 0) and (2.67, 4)

C) local maximum at (0, 6)
local minimum at (2.67, -3.48)
increasing on (-1, 0) and (2.67, 4)
decreasing on (0, 2.67)

D) local maximum at (0, 6)
local minimum at (2.67, -3.48)
increasing on (0, 2.67)
decreasing on (-1, 0) and (2.67, 4)

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

27) $f(x) = \sqrt{2x - 1};$ from 1 to 5 27) _____

A) -28 B) $\frac{1}{2}$ C) $-\frac{1}{6}$ D) -2

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

28) $f(x) = x^3 - x$ 28) _____

A) y = -6x - 6 B) y = 6x - 6 C) y = -6x + 6 D) y = 6x + 6

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

29) The graph of $y = x^2$, shifted 7 units downward 29) _____

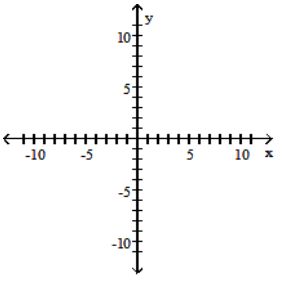
A) $y = x^2 + 7$ B) $y = x^2 - 7$ C) $y = \frac{x^2}{7}$ D) $y = 7x^2$

30) The graph of $y = |x|$, shifted 5 units to the right 30) _____

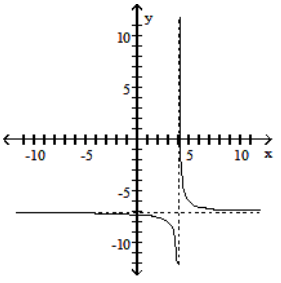
A) $y = |x - 5|$ B) $y = |x| - 5$ C) $y = |x + 5|$ D) $y = |x| + 5$

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

31) $f(x) = \frac{1}{x + 4} + 7$ 31) _____



A)



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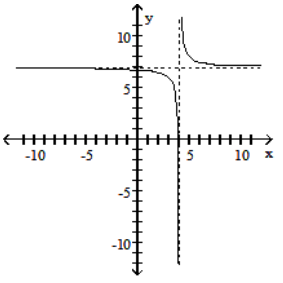
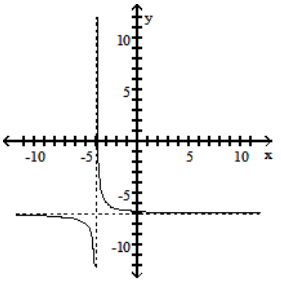
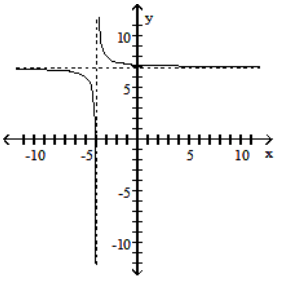


C)



D)



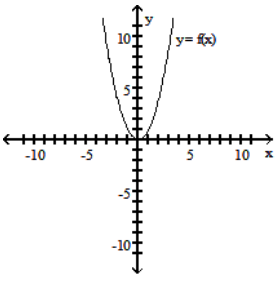
Write the equation that results in the desired transformation.

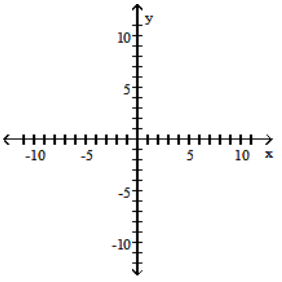
32) The graph of $y = x^2$, vertically stretched by a factor of 3 32) _____

A) $y = -3x^2$ B) $y = (x - 3)^2$ C) $y = 3(x - 3)x^2$ D) $y = 3x^2$

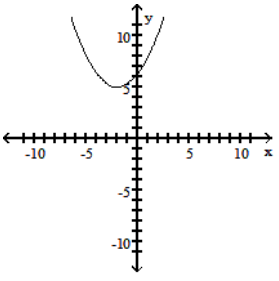
Use the accompanying graph of y = f(x) to sketch the graph of the indicated equation.

33) $y = -\frac{1}{3}f(x + 5) + 2$ 33) _____





A)



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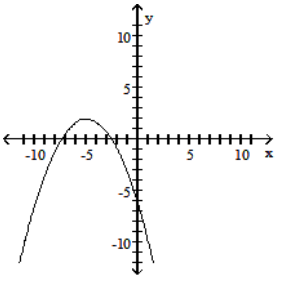

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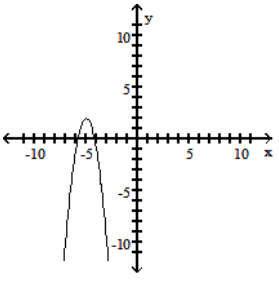
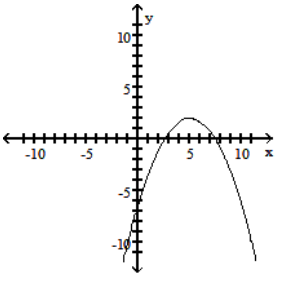


D)



Solve the problem.

34) A rocket is shot straight up in the air from the ground at a rate of 67 feet per second. The rocket is tracked by a range finder that is 436 feet from the launch pad. Let d represent the distance from the rocket to the range finder and t represent the time, in seconds, since "blastoff". Express d as a function of t. 34) _____

A) $d(t) = 436^2 + (67t)^2$

B) $d(t) = \sqrt{67^2 + (436t)^2}$

C) $d(t) = \sqrt{436^2 + (67t)^2}$

D) $d(t) = 436 + 67t^2$

Determine the average rate of change for the function.

35) $f(x) = 5x + 6$ 35) _____

A) -5 B) 6 C) 5 D) -6

Solve the problem.

36) A lumber yard has fixed costs of $1064.00 per day and variable costs of $0.37 per board-foot produced. Lumber sells for $1.37 per board-foot. How many board-feet must be produced and sold daily to break even? 36) _____

A) 709 board-feet

B) 611 board-feet

C) 2875 board-feet

D) 1064 board-feet

Find the vertex and axis of symmetry of the graph of the function.

37) $f(x) = 3x^2 - 30x$ 37) _____

A) (-5, 0); $x = -5$

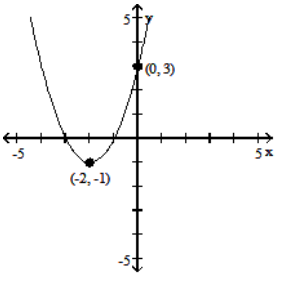
B) (5, -75); $x = 5$

C) (-5, -75); $x = -5$

D) (5, 0); $x = 5$

Determine the quadratic function whose graph is given.

38) 38) _____



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

B) $f(x) = -x^2 - 4x - 3$

C) $f(x) = -x^2 + 4x + 3$

D) $f(x) = x^2 + 4x + 3$

Solve the inequality.

39) $x^2 - 3x - 28 \leq 0$ 39) _____

A) [-4, 7]

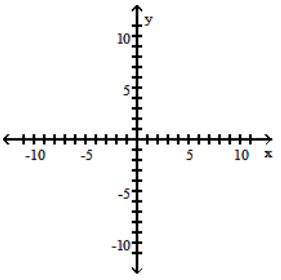
B) [7, ∞)

C) (-∞, -4] or [7, ∞)

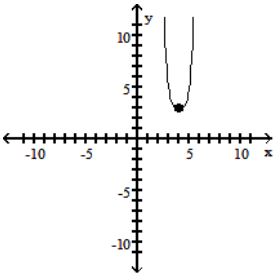
D) (-∞, -4]

Use transformations of the graph of $y = x^4$ or $y = x^5$ to graph the function.

40) $f(x) = -2(x - 4)^4 + 3$ 40) _____



A)



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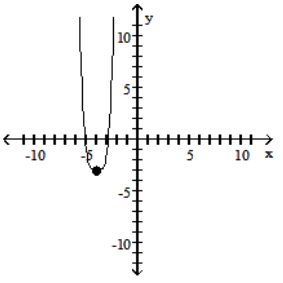

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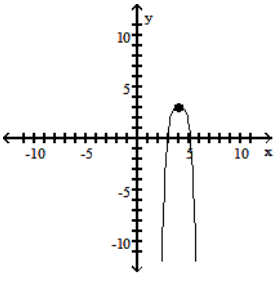
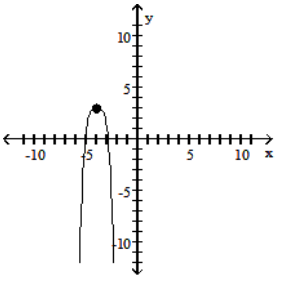
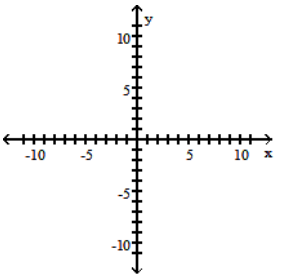


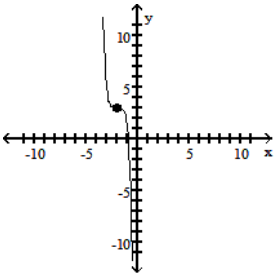
D)



41) $f(x) = -2(x - 2)^5 + 3$ 41) _____



A)



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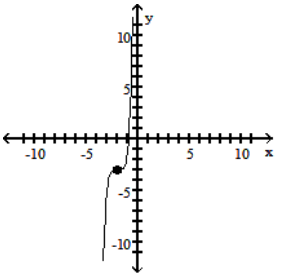
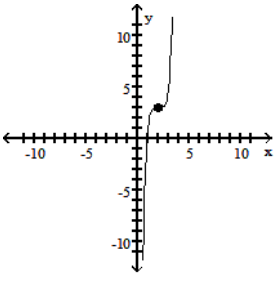
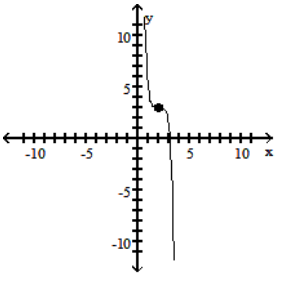


C)



D)



For the polynomial, list each real zero and its multiplicity. Determine whether the graph crosses or touches the x-axis at each x -intercept.

42) $f(x) = \frac{1}{5}x^2(x^2 - 3)(x - 4)$ 42) _____

A) 0, multiplicity 2, touches x-axis;
4, multiplicity 1, crosses x-axis;
$\sqrt{3}$, multiplicity 1, crosses x-axis;
$-\sqrt{3}$, multiplicity 1, crosses x-axis

B) 0, multiplicity 2, crosses x-axis;
4, multiplicity 1, touches x-axis;
$\sqrt{3}$, multiplicity 1, touches x-axis;
$-\sqrt{3}$, multiplicity 1, touches x-axis

C) 0, multiplicity 2, crosses x-axis;
4, multiplicity 1, touches x-axis

D) 0, multiplicity 2, touches x-axis;
4, multiplicity 1, crosses x-axis

Find the power function that the graph of f resembles for large values of |x|.

43) $f(x) = (x - 7)^3(x - 7)^6$ 43) _____

A) $y = x^{18}$ B) $y = x^6$ C) $y = x^9$ D) $y = x^3$

Determine the maximum number of turning points of f.

44) $f(x) = -x^2(x + 6)^3(x^2 - 1)$ 44) _____

A) 7 B) 6 C) 2 D) 5

List the potential rational zeros of the polynomial function. Do not find the zeros.

45) $f(x) = x^5 - 5x^2 + 4x + 35$ 45) _____

A) $\pm 1, \pm\frac{1}{7}, \pm\frac{1}{5}, \pm\frac{1}{35}, \pm 7, \pm 5, \pm 35$ B) $\pm 1, \pm 7, \pm 5$

C) $\pm 1, \pm\frac{1}{7}, \pm\frac{1}{5}, \pm\frac{1}{35}$ D) $\pm 1, \pm 7, \pm 5, \pm 35$

Find the intercepts of the function f(x).

46) $f(x) = x^3 + 2x^2 - 9x - 18$ 46) _____

A) x-intercepts: -3, 2, 3; y-intercept: -18
B) x-intercept: -2; y-intercept: -18
C) x-intercepts: -3, -2, 3; y-intercept: -18
D) x-intercept: -3; y-intercept: -18

Find the real solutions of the equation.

47) $x^4 - 5x^2 - 36 = 0$ 47) _____

A) {-2, 2} B) {-3, 3} C) {-6, 6} D) {-3, -2, 2, 3}

Information is given about a polynomial f(x) whose coefficients are real numbers. Find the remaining zeros of f.

48) Degree 3; zeros: 3, 4 - i 48) _____

A) -3 B) -4 + i C) 4 + i D) no other zeros

Find all zeros of the function and write the polynomial as a product of linear factors.

49) $f(x) = x^3 - x^2 + 16x - 16$ 49) _____

A) $f(x) = (x - 1)(x + 4i)(x - 4i)$
B) $f(x) = (x - 1)(x + 1)(x + 16)$
C) $f(x) = (x - 1)(x + 4)(x - 4)$
D) $f(x) = (x - 25)(x + i)(x - i)$

Find the vertical asymptotes of the rational function.

50) $h(x) = \frac{8x}{(x + 2)(x - 9)}$ 50) _____

A) $x = 2, x = -9$ B) $x = -2, x = 9, x = -8$
C) $x = -2, x = 9$ D) $x = -8$

Give the equation of the horizontal asymptote, if any, of the function.

51) $h(x) = \frac{4x - 4}{x - 5}$ 51) _____

A) $y = 5$ B) $y = 0$
C) $y = 4$ D) no horizontal asymptotes

52) $g(x) = \frac{x^2 + 8x - 5}{x - 5}$ 52) _____

A) $y = 5$ B) $y = 0$
C) $y = 1$ D) no horizontal asymptotes

53) $g(x) = \frac{x + 9}{x^2 - 49}$ 53) _____

A) $y = 1$ B) no horizontal asymptotes
C) $y = -7, y = 7$ D) $y = 0$

Find the indicated intercept(s) of the graph of the function.

54) y-intercept of $f(x) = \frac{x - 2}{3x - 8}$ 54) _____

A) $(0, -4)$ B) $(0, 2)$ C) $\left(0, \frac{1}{4}\right)$ D) none

55) x-intercepts of $f(x) = \frac{x^2 + 9x}{x^2 + 5x - 4}$ 55) _____

A) $(0, 0), (-9, 0)$ B) $(0, 0), (9, 0)$ C) $(9, 0)$ D) $(-9, 0)$

Find the vertical asymptotes of the rational function.

56) $f(x) = \frac{x + 4}{x^2 - 9}$ 56) _____

A) $x = -3, x = 3, x = -4$ B) $x = 9, x = -4$
C) $x = -3, x = 3$ D) $x = 0, x = 9$

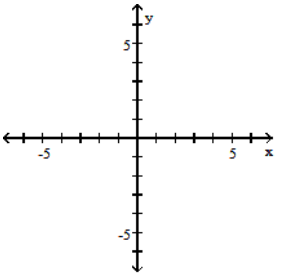
For the given functions f and g, find the requested composite function value.

57) $f(x) = 7x + 8$, $g(x) = -1/x$; Find $(g \circ f)(3)$. 57) _____

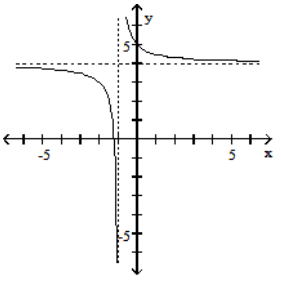
A) $-\frac{29}{3}$ B) $-\frac{1}{29}$ C) $\frac{86}{3}$ D) $\frac{17}{3}$

Graph the function using transformations.

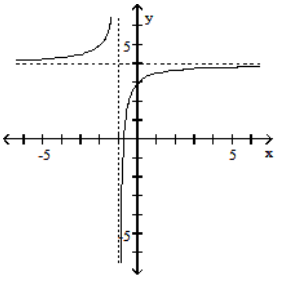
58) $f(x) = \frac{1}{x + 4} + 1$ 58) _____



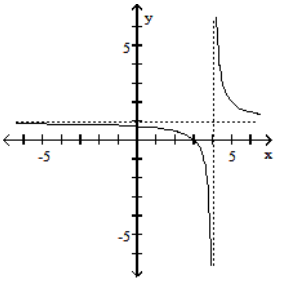
A)



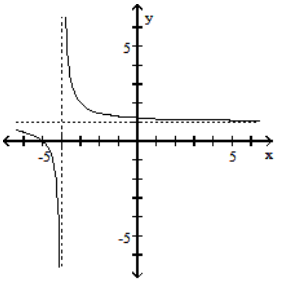
B)



C)

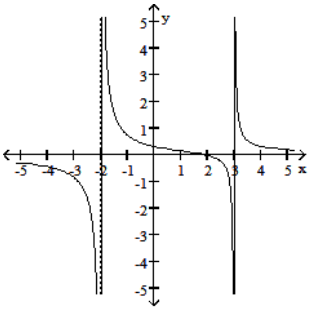


D)



Solve the problem.

59) Decide which of the rational functions might have the given graph. 59) _____



A) $R(x) = \dfrac{x - 2}{(x + 2)^2(x - 3)^2}$

B) $R(x) = \dfrac{x - 2}{(x + 2)(x - 3)}$

C) $R(x) = \dfrac{2 - x}{(x + 2)(x - 3)}$

D) $R(x) = \dfrac{x + 2}{(x - 2)(x + 3)}$

Solve the inequality algebraically. Express the solution in interval notation.

60) $(x - 5)^2(x + 1) < 0$ 60) _____

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

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

C) $(-\infty, -1)$ or $(1, \infty)$

D) $(-1, \infty)$

61) $(x + 7)(x + 5)(x - 6) > 0$ 61) _____

A) $(-\infty, -7) \cup (-5, 6)$

B) $(-7, -5) \cup (6, \infty)$

C) $(6, \infty)$

D) $(-\infty, -5)$

62) $x^4 - 21x^2 - 100 > 0$ 62) _____

A) $(-\infty, -5) \cup (5, \infty)$

B) $(-\infty, -5) \cup (-2, 2) \cup (5, \infty)$

C) $(-5, 5)$

D) $(-5, -2) \cup (2, 5)$

63) $x^3 \geq 64$ 63) _____

A) $[-4, 4]$

B) $(-\infty, -4] \cup [4, \infty)$

C) $(-\infty, 4]$

D) $[4, \infty)$

64) $\dfrac{x - 1}{x + 2} < 0$ 64) _____

A) $(-\infty, -2) \cup (1, \infty)$

B) $(1, \infty)$

C) $(-\infty, -2)$

D) $(-2, 1)$

65) $\dfrac{x - 6}{x + 3} < 1$ 65) _____

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

B) $(-3, \infty)$

C) $(-3, 6)$

D) $(-\infty, -3) \cup (6, \infty)$

66) $\frac{x^2(x - 11)(x + 1)}{(x - 4)(x + 8)} \geq 0$ 66) _____

A) $(-\infty, -8) \cup [-1, 4) \cup [11, \infty)$ B) $(-\infty, -8) \cup [-1, 0) \cup (0, 4) \cup [11, \infty)$
C) $(-8, -1] \cup (4, 11]$ D) $(-\infty, -8) \cup [11, \infty)$

Evaluate the expression using the values given in the table.

67) $(g \circ f)(1)$ 67) _____

x	1	7	9	12
f(x)	-4	9	2	14

x	-5	-4	1	3
g(x)	1	-7	7	9

A) 9 B) 7 C) -7 D) -4

Solve the problem.

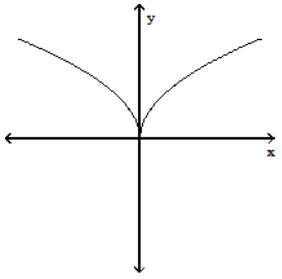
68) What is the domain of the function $f(x) = \sqrt{\frac{x - 9}{x + 7}}$? 68) _____

A) $(-\infty, -7)$ B) $(-\infty, -7) \cup (9, \infty)$ C) $(-\infty, -7) \cup [9, \infty)$ D) $[9, \infty)$

69) An oil well off the Gulf Coast is leaking, with the leak spreading oil over the surface of the gulf as a circle. At any time t, in minutes, after the beginning of the leak, the radius of the oil slick on the surface is r(t) = 3t ft. Find the area A of the oil slick as a function of time. 69) _____

A) $A(r(t)) = 9t^2$ B) $A(r(t)) = 9\pi t^2$ C) $A(r(t)) = 9\pi t$ D) $A(r(t)) = 3\pi t^2$

Use the horizontal line test to determine whether the function is one-to-one.

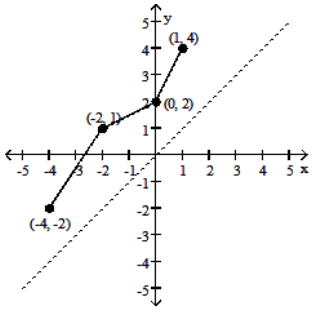
70) 

70) _____

A) Yes

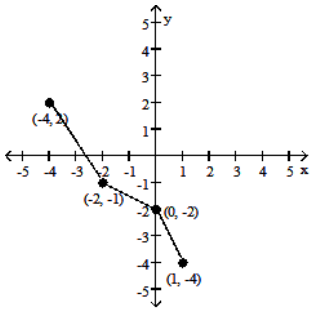
B) No

Use the graph of the given one-to-one function to sketch the graph of the inverse function. For convenience, the graph of y = x is also given.

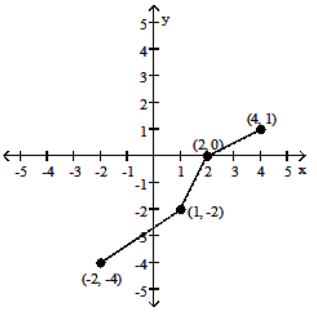
71) 

71) _____

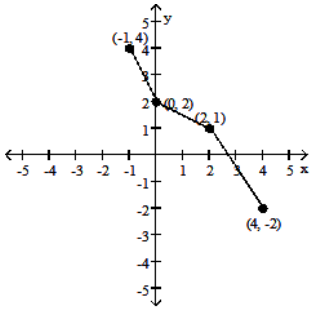
A)



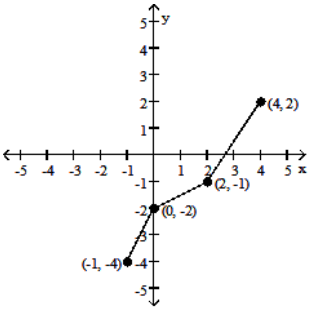
B)



C)



D)



Find the inverse function of f. State the domain and range of f.

72) $f(x) = \frac{3x - 2}{x + 5}$ 72) _____

A) $f^{-1}(x) = \frac{3x + 2}{x - 5}$; domain of f: {x | x ≠ -5}; range of f: {y | y ≠ 5}

B) $f^{-1}(x) = \frac{5x + 2}{3 + x}$; domain of f: {x | x ≠ -5}; range of f: {y | y ≠ - 3}

C) $f^{-1}(x) = \frac{x + 5}{3x - 2}$; domain of f: {x | x ≠ -5}; range of f: {y | y ≠ $\frac{2}{3}$}

D) $f^{-1}(x) = \frac{5x + 2}{3 - x}$; domain of f: {x | x ≠ -5}; range of f: {y | y ≠ 3}

Change the exponential expression to an equivalent expression involving a logarithm.

73) $e^x = 16$ 73) _____

A) $\log_x e = 16$ B) $\ln 16 = x$ C) $\ln x = 16$ D) $\log_{16} x = e$

Change the logarithmic expression to an equivalent expression involving an exponent.

74) $\log_4 64 = x$ 74) _____

A) $4^x = 64$ B) $64^4 = x$ C) $x^4 = 64$ D) $64^x = 4$

Find the exact value of the logarithmic expression.

75) $\log_{11} 1$ 75) _____

A) 11 B) $\frac{1}{11}$ C) 0 D) 1

76) $\log_7 49$ 76) _____

A) 49 B) 2 C) 7 D) 14

77) $\ln 1$ 77) _____

A) e B) -1 C) 1 D) 0

78) $\ln e$ 78) _____

A) 0 B) e C) -1 D) 1

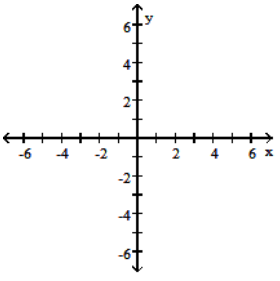
Find the domain of the function.

79) $f(x) = \log(x - 4)$ 79) _____

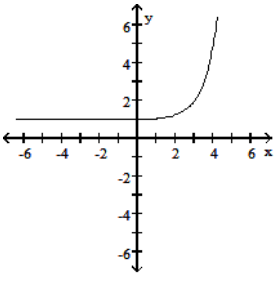
A) $(0, \infty)$ B) $(4, \infty)$ C) $(1, \infty)$ D) $(-4, \infty)$

Graph the function.

80) $f(x) = 4^{(x - 3)} - 1$ 80) _____



A)



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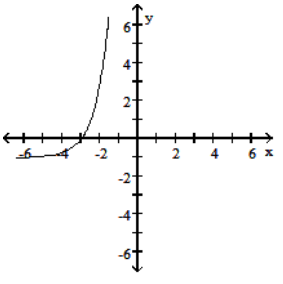

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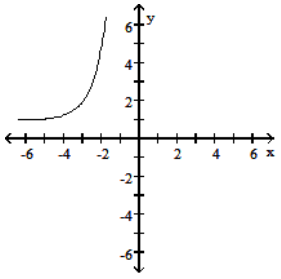
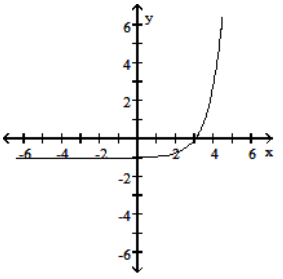


D)



Solve the equation.

81) $\log_6 (x^2 - 5x) = 1$ 81) _____

A) {-6, 1} B) {1} C) {6} D) {6, -1}

82) $6 + 4 \ln x = 4$ 82) _____

A) $\left\{\frac{e^{-2}}{4}\right\}$ B) $\left\{\frac{-2}{4 \ln 1}\right\}$ C) $\{e^{-1/2}\}$ D) $\left\{\ln\left(-\frac{1}{2}\right)\right\}$

83) $e^{3x} = 5$ 83) _____

A) $\{3 \ln 5\}$ B) $\left\{\frac{5}{3}e\right\}$ C) $\left\{\frac{\ln 3}{5}\right\}$ D) $\left\{\frac{\ln 5}{3}\right\}$

Use the properties of logarithms to find the exact value of the expression. Do not use a calculator.

84) $\ln e^{\sqrt{7}}$ 84) _____

A) 49 B) e C) $\sqrt{7}$ D) 7

85) $\log_4 24 - \log_4 6$ 85) _____

A) 24 B) 4 C) 6 D) 1

Write as the sum and/or difference of logarithms. Express powers as factors.

86) $\log_5 \left(\frac{x^4}{y^8}\right)$ 86) _____

A) $\frac{1}{2} \log_5 \left(\frac{x}{y}\right)$ B) $4 \log_5 x - 8 \log_5 y$

C) $4 \log_5 x + 8 \log_5 y$ D) $8 \log_5 y - 4 \log_5 x$

87) $\ln \frac{(8x)\sqrt[11]{1+4x}}{(x-6)^9}$, $x > 6$ 87) _____

A) $\ln 8 + \ln x + \frac{1}{11}\ln(1+4x) - \ln 9 - \ln(x-6)$

B) $\ln 8 + \ln x + \frac{1}{11}\ln(1+4x) - 9\ln(x-6)$

C) $8\ln x + \frac{4}{11}\ln(1+4x) - 9\ln(x-6)$

D) $\ln 8 + \ln x - 11\ln(1+4x) - 9\ln(x-6)$

Solve the equation.

88) $\log_3 x + \log_3(x-24) = 4$ 88) _____

A) {53} B) {27} C) {-3, 27} D) $\varnothing$

Solve the problem.

89) The half-life of silicon-32 is 710 years. If 50 grams is present now, how much will be present in 700 years? (Round your answer to three decimal places.) 89) _____

A) 0 B) 46.697 C) 25.245 D) 0.054

90) The half-life of a radioactive element is 130 days, but your sample will not be useful to you after 80% of the radioactive nuclei originally present have disintegrated. About how many days can you use the sample? 90) _____

A) 297 B) 302 C) 312 D) 287

Convert the angle to D° M' S'' form. Round the answer to the nearest second.

91) 51.46° 91) _____

A) 51°27'42" B) 51°27'36" C) 51°27'46" D) 51°27'24"

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

92) 160° 92) _____

A) $\frac{7\pi}{8}$ B) $\frac{9\pi}{8}$ C) $\frac{9\pi}{10}$ D) $\frac{8\pi}{9}$

Convert the angle in radians to degrees.

93) $\frac{11\pi}{12}$ 93) _____

A) 160° B) 210° C) 165° D) 150°

Convert the angle in radians to degrees. Express the answer in decimal form, rounded to two decimal places.

94) 1 94) _____

A) 57.55° B) 57.3° C) 0.02° D) -0.05°

Find the exact value. Do not use a calculator.

95) $\sec \frac{\pi}{4}$ 95) _____

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

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

96) $(-2, -1)$ Find $\sec\theta$. 96) _____

A) $-\frac{\sqrt{5}}{2}$ B) $-\frac{3\sqrt{5}}{5}$ C) $\frac{\sqrt{5}}{2}$ D) $-\sqrt{5}$

Solve the problem.

97) If $\sin\theta = -0.9$, find the value of $\sin\theta + \sin(\theta + 2\pi) + \sin(\theta + 4\pi)$. 97) _____

A) $-2.7 + 6\pi$ B) -0.7 C) -2.7 D) -0.9

Name the quadrant in which the angle θ lies.

98) $\tan\theta > 0$, $\sin\theta < 0$ 98) _____

A) I B) II C) III D) IV

Solve the problem.

99) Which of the following trigonometric values are negative? 99) _____

I. $\sin(-292°)$
II. $\tan(-193°)$
III. $\cos(-207°)$
IV. $\cot 222°$

A) II, III, and IV B) I and III C) III only D) II and III

Use the properties of the trigonometric functions to find the exact value of the expression. Do not use a calculator.

100) $\sin^2 55° + \cos^2 55°$ 100) _____

A) 0 B) 2 C) 1 D) -1

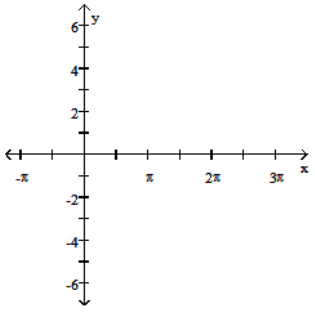
Find the exact value of the indicated trigonometric function of θ.

101) $\csc\theta = -\frac{7}{4}$, θ in quadrant III Find $\cot\theta$. 101) _____

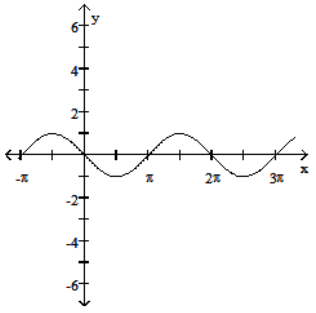
A) $-\frac{\sqrt{33}}{7}$ B) $-\frac{4\sqrt{33}}{33}$ C) $\frac{\sqrt{33}}{4}$ D) $-\frac{7\sqrt{33}}{33}$

Use transformations to graph the function.

102) $y = \sin(\pi x)$ 102) _____



A)



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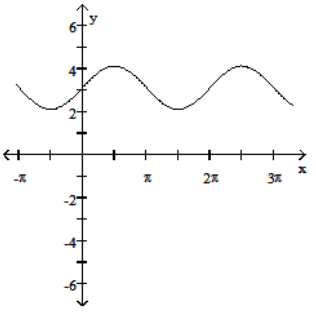
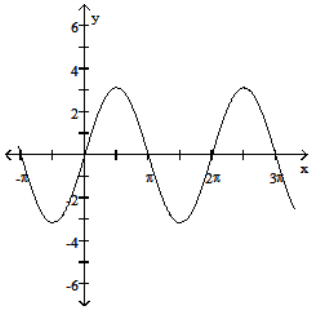
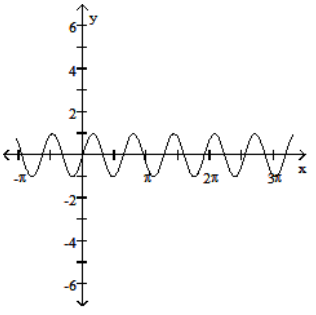


C)

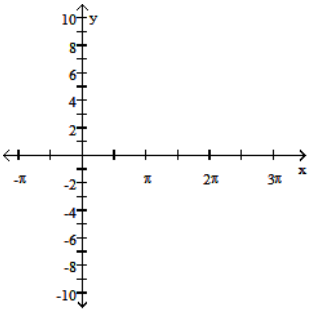


D)

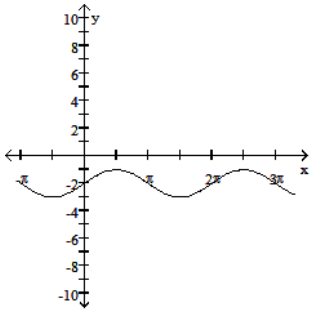


103) y = 5 sin x - 2

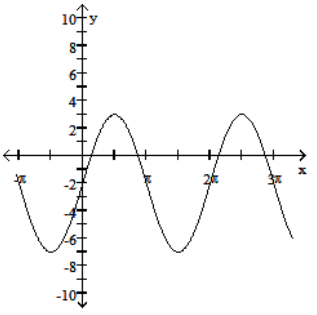
103) _____



A)



B)



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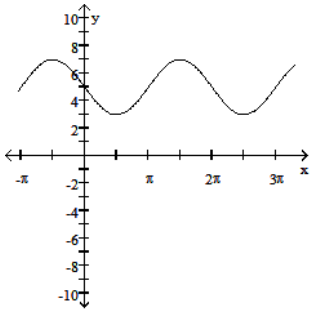
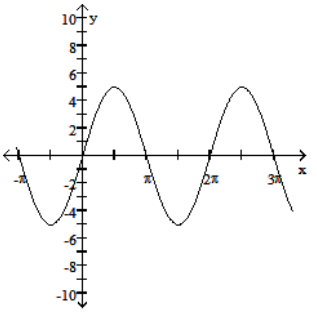


D)



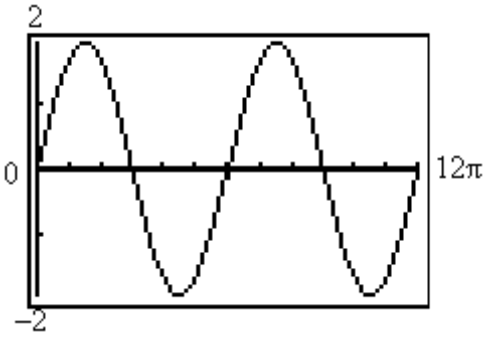
Without graphing the function, determine its amplitude or period as requested.

104) $y = \cos 5x$ Find the period. 104) _____

A) 2π B) 5 C) 1 D) $\frac{2\pi}{5}$

Answer the question.

105) Which one of the equations below matches the graph? 105) _____

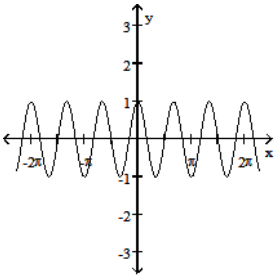


A) $y = 2 \sin\left(\frac{1}{3}x\right)$ B) $y = 2 \cos\left(\frac{1}{3}x\right)$ C) $y = 2 \cos(3x)$ D) $y = -2 \sin\left(\frac{1}{3}x\right)$

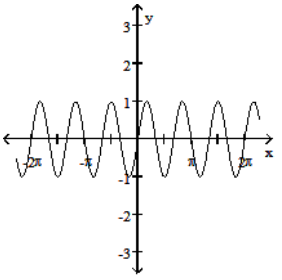
Match the given function to its graph.

106) 1) $y = \sin(3x)$ 2) $y = 3\cos x$ 3) $y = 3\sin x$ 4) $y = \cos(3x)$ 106) _____

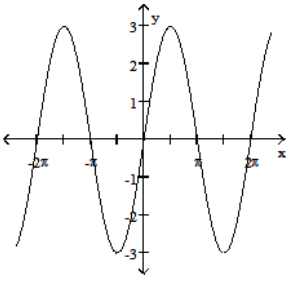
A



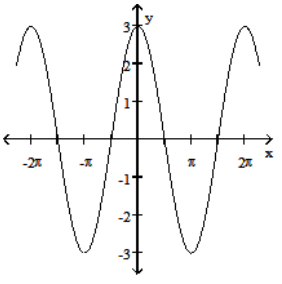
B



C



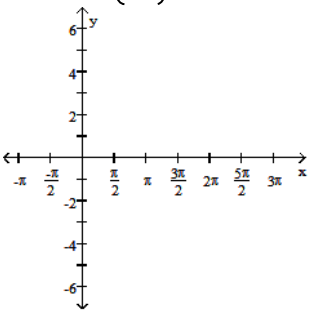
D



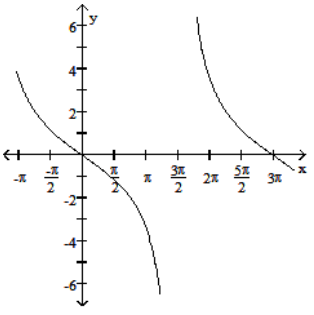
A) 1A, 2D, 3C, 4B B) 1A, 2B, 3C, 4D C) 1B, 2D, 3C, 4A D) 1A, 2C, 3D, 4B

Graph the function.

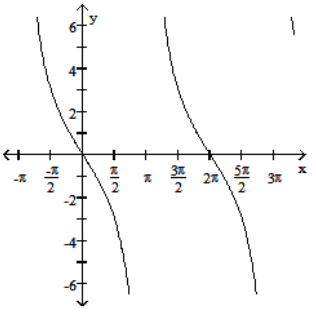
107) $y = -3\tan\left(\frac{1}{2}x\right)$ 107) _____



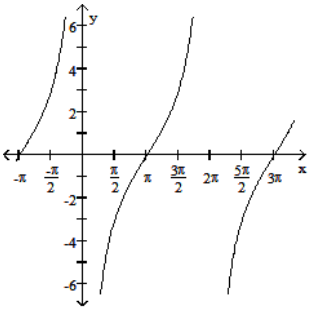
A)



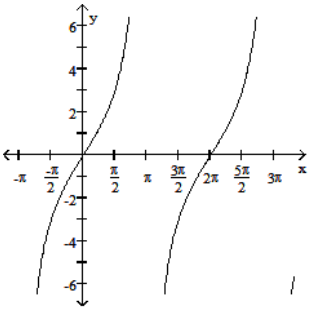
B)



C)



D)



Solve the problem.

108) What is the y-intercept of y = sec x? 108) _____

A) $\frac{\pi}{2}$ B) 1 C) 0 D) none

109) Find the average rate of change of f(x) = sec x from 0 to $\frac{\pi}{4}$. 109) _____

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

Find (i) the amplitude, (ii) the period, and (iii) the phase shift.

110) $y = -\frac{1}{2}\sin(4x + 3\pi)$ 110) _____

A) (i) $\frac{1}{2}$ (ii) $\frac{\pi}{2}$ (iii) $-\frac{3\pi}{4}$ B) (i) $-\frac{1}{2}$ (ii) 4 (iii) $-\frac{4\pi}{3}$

C) (i) 2 (ii) $\frac{\pi}{2}$ (iii) 3π D) (i) $\frac{1}{2}$ (ii) 4 (iii) $-\frac{3\pi}{4}$

Find the phase shift.

111) $y = -4\sin\left(4x - \frac{\pi}{2}\right)$ 111) _____

A) 4π units down B) 4π units up

C) $\frac{\pi}{2}$ units to the left D) $\frac{\pi}{8}$ units to the right

Find the exact value of the expression.

112) $\sin^{-1}\frac{\sqrt{3}}{2}$ 112) _____

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

113) $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ 113) _____

A) $\frac{2\pi}{3}$ B) $\frac{5\pi}{6}$ C) $-\frac{3\pi}{4}$ D) $\frac{\pi}{6}$

114) $\sin(\tan^{-1} 2)$ 114) _____

A) $\frac{2\sqrt{5}}{5}$ B) $5\sqrt{2}$ C) $2\sqrt{5}$ D) $\frac{5\sqrt{2}}{2}$

Write the trigonometric expression as an algebraic expression in u.

115) $\sin(\tan^{-1} u)$ 115) _____

A) $\frac{u\sqrt{u^2 - 1}}{u^2 - 1}$ B) $u\sqrt{u^2 + 1}$ C) $\frac{u\sqrt{u^2 + 1}}{u^2 + 1}$ D) $\frac{\sqrt{u^2 + 1}}{u^2 + 1}$

116) $\cos(\sin^{-1} u)$ 116) _____

A) $\sqrt{u^2 + 1}$ B) $\sqrt{1 - u^2}$ C) $\frac{\sqrt{u^2 + 1}}{u}$ D) $\sqrt{u^2 - 1}$

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

117) $4\cos^2 x - 3 = 0$ 117) _____

A) $\left\{\frac{\pi}{3}, \frac{5\pi}{3}\right\}$ B) $\left\{\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}\right\}$

C) $\left\{\frac{\pi}{6}, \frac{11\pi}{6}\right\}$ D) $\left\{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}\right\}$

118) $2\sin^2\theta - 3\sin\theta - 2 = 0$ 118) _____

A) $\left\{\frac{\pi}{2}, \frac{5\pi}{6}, \frac{7\pi}{6}\right\}$ B) $\left\{\frac{7\pi}{6}, \frac{11\pi}{6}\right\}$ C) $\left\{\frac{4\pi}{3}, \frac{5\pi}{3}\right\}$ D) $\left\{\frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}\right\}$

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

119) $\cos(2\theta) = \frac{\sqrt{2}}{2}$ 119) _____

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

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

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

120) $2\sin^2\theta = 3(\cos\theta + 1)$ 120) _____

A) $\left\{\frac{5\pi}{6}, \pi, \frac{7\pi}{6}\right\}$ B) $\left\{0, \frac{5\pi}{6}, \frac{11\pi}{6}\right\}$ C) $\left\{0, \frac{2\pi}{3}, \frac{5\pi}{3}\right\}$ D) $\left\{\frac{2\pi}{3}, \pi, \frac{4\pi}{3}\right\}$

Find the exact value of the expression.

121) $\sin 75°$ 121) _____

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

Use the information given about the angle θ, $0 \le \theta \le 2\pi$, to find the exact value of the indicated trigonometric function.

122) $\sin\theta = \frac{15}{17}$, $0 < \theta < \frac{\pi}{2}$ Find $\cos(2\theta)$. 122) _____

A) $-\frac{162}{289}$ B) $\frac{240}{289}$ C) $\frac{161}{289}$ D) $-\frac{161}{289}$

123) $\sin\theta = -\frac{4}{5}$, $\frac{3\pi}{2} < \theta < 2\pi$ Find $\sin(2\theta)$. 123) _____

A) $\frac{7}{25}$ B) $-\frac{7}{25}$ C) $-\frac{24}{25}$ D) $\frac{24}{25}$

Solve the problem.

124) From the edge of a 1000-foot cliff, the angles of depression to two cars in the valley below are 21° and 28°. How far apart are the cars? Round your answers to the nearest 0.1 ft. 124) _____

A) 713.4 ft B) 724.5 ft C) 714.4 ft D) 724.4 ft

125) John (whose line of sight is 6 ft above horizontal) is trying to estimate the height of a tall oak tree. He first measures the angle of elevation from where he is standing as 35°. He walks 30 feet closer to the tree and finds that the angle of elevation has increased by 12°. Estimate the height of the tree rounded to the nearest whole number. 125) _____

A) 86 ft B) 67 ft C) 90 ft D) 61 ft

Answer Key
Testname: AP CALCULUS SUMMER HOMEWORK

1) B
2) C
3) B
4) B
5) B
6) C
7) A
8) B
9) C
10) C
11) B
12) C
13) B
14) D
15) A
16) C
17) D
18) C
19) C
20) D
21) B
22) D
23) A
24) A
25) B
26) C
27) B
28) B
29) B
30) A
31) D
32) D
33) B
34) C
35) C
36) D
37) B
38) D
39) A
40) C
41) D
42) A
43) C
44) B
45) D
46) C
47) B
48) C
49) A
50) C

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

101) C
102) D
103) B
104) D
105) A
106) C
107) B
108) B
109) B
110) A
111) D
112) D
113) B
114) A
115) C
116) B
117) D
118) B
119) D
120) D
121) C
122) D
123) C
124) D
125) B