2013-14 Semester 1 Exam Review - Precalculus Test ID: _____

Use interval notation to describe the interval of real numbers.

1) x is greater than or equal to 0 and less than or equal to 4. 1) _____

A) [0, 4) B) (0, 4] C) (0, 4) D) [0, 4]

Use words to describe the interval of real numbers.

2) $x < -6$ 2) _____

A) The real numbers greater than -6.
B) The real numbers less than or equal to -6.
C) The real numbers greater than or equal to -6.
D) The real numbers less than -6.

3) (-5, 3) 3) _____

A) The real numbers less than 3.
B) The real numbers greater than -5.
C) The real numbers greater than or equal to -5 and less than 3.
D) The real numbers greater than -5 and less than 3.

Simplify the expression. Assume that the variables in the denominator are nonzero.

4) $\left(\frac{12a^8b^5}{ab^2}\right)\left(\frac{2b^2}{4a^3b^7}\right)$ 4) _____

A) $\frac{1}{6a^4b^2}$ B) $6a^4b^2$ C) $\frac{6a^4}{b^2}$ D) $\frac{3a^4}{b^2}$

5) $\frac{(2x^3)^2z^5}{2z^9}$ 5) _____

A) $2x^6z^4$ B) $\frac{x^6}{2z^4}$ C) $\frac{2x^6}{z^4}$ D) $\frac{x^6}{z^4}$

Write the number in scientific notation.

6) 0.0000027813 6) _____

A) 2.7813×10^{-6} B) 2.7813×10^{-5} C) 2.7813×10^{6} D) 2.7813×10^{-7}

7) 58.7616 7) _____

A) 5.87616×10^{2} B) 5.87616×10^{-2} C) 5.87616×10^{1} D) 5.87616×10^{-1}

Write the number in decimal form.

8) 6.07×10^4 8) _____

A) 607,000 B) 60,700 C) 6070 D) 242.8

9) 4.49×10^{-4} 9) _____

A) 0.000449 B) 0.0000449 C) 0.00449 D) -449,000

Solve the equation.

10) $\frac{1}{4}(8x - 12) = \frac{1}{3}(9x - 6)$ 10) _____

A) $x = -5$ B) $x = -1$ C) $x = \frac{1}{5}$ D) $x = 1$

11) $\frac{x + 6}{7} = \frac{x + 7}{8}$ 11) _____

A) $x = \frac{13}{56}$ B) $x = \frac{1}{56}$ C) $x = \frac{13}{15}$ D) $x = 1$

Solve the inequality.

12) $-6 < 4q - 2 < 0$ 12) _____

A) $-\frac{1}{2} < q < \frac{1}{2}$ B) $-1 < q < \frac{1}{2}$ C) $-2 < q < \frac{1}{2}$ D) $-1 < q < 2$

Find a point-slope form equation for the line through the point with the given slope.

13) $(-4, 9)$, $m = -5$ 13) _____

A) $y - 9 = -5(x - 4)$ B) $y - 9 = -5(x + 4)$ C) $y - 9 = 5(x + 4)$ D) $y + 9 = -5(x + 4)$

Find a slope-intercept form equation for the line.

14) Through $(0, 4)$, with slope $\frac{1}{2}$ 14) _____

A) $y = 4x - \frac{3}{6}$ B) $y = 4x + \frac{3}{6}$ C) $y = \frac{3}{6}x - 4$ D) $y = \frac{3}{6}x + 4$

Solve the problem.

15) Suppose the sales of a particular brand of appliance satisfy the relationship $S(x) = 240x + 4900$, where $S(x)$ represents the number of sales in year x, with $x = 0$ corresponding to 1982. Find the number of sales in 1992. 15) _____

A) 14,360 B) 7300 C) 14,600 D) 7060

16) Let $C(x) = 100 + 90x$ be the cost to manufacture x items. Find the average cost per item to produce 80 items. Round to the nearest dollar. 16) _____

A) $214 B) $91 C) $160 D) $169

Use a method of your choice to solve the equation.

17) $x^2 + 3x - 28 = 0$ 17) _____

A) $x = -4$ or $x = 7$ B) $x = 4$or $x = 7$ C) $x = 4$ or $x = -7$ D) $x = -4$ or $x = -7$

18) $x^2 + 4x - 21 = 0$ 18) _____

A) $x = 3$or $x = 7$ B) $x = -3$ or $x = 7$ C) $x = -3$ or $x = -7$ D) $x = 3$ or $x = -7$

19) $|2x - 9| = 4$ 19) _____

A) $x = -\frac{13}{2}$ or $x = \frac{13}{2}$

B) $x = \frac{5}{2}$ or $x = \frac{13}{2}$

C) $x = 5$ or $x = 13$

D) $x = -\frac{9}{2}$ or $x = \frac{9}{2}$

20) $x^3 - 12x^2 + 48x - 70 = 0$ 20) _____

A) $x = 5.82$ B) $x = 2.18$ C) $x = 4$ D) $x = -2.18$

Write the sum or difference in the standard form a + bi.

21) $(8 + 8i) - (-7 + i)$ 21) _____

A) $-15 - 7i$ B) $15 - 7i$ C) $15 + 7i$ D) $1 + 9i$

22) $5i + (-7 - i)$ 22) _____

A) $-7 + 6i$ B) $7 - 6i$ C) $-7 + 4i$ D) $7 - 4i$

Write the product in standard form.

23) $(6 - 3i)(5 - 7i)$ 23) _____

A) $9 - 57i$ B) $21i^2 - 57i + 30$ C) $51 + 27i$ D) $9 + 57i$

24) $(2 + 7i)(4 - 3i)$ 24) _____

A) $29 + 22i$ B) $-21i^2 + 22i + 8$ C) $-13 + 34i$ D) $29 - 22i$

Write the expression in the form bi, where b is a real number.

25) $\sqrt{-2500}$ 25) _____

A) $50i$ B) ± 50 C) $-50i$ D) $i\sqrt{50}$

26) $\sqrt{-270}$ 26) _____

A) $-3\sqrt{30}$ B) $3i\sqrt{30}$ C) $3\sqrt{30}$ D) $-3i\sqrt{30}$

Find the real numbers x and y that make the equation true.

27) $(-3 - 7i) + 7 = x - (5 + yi)$ 27) _____

A) $x = -15, y = 7$ B) $x = 9, y = 7$ C) $x = -5, y = -7$ D) $x = -5, y = 7$

Solve the equation.

28) $-5x^2 - 5x - 4 = 0$ 28) _____

A) $\frac{1}{2} \pm \frac{\sqrt{55}}{10}$ B) $-\frac{1}{2} \pm \frac{\sqrt{55}}{10}i$ C) $\frac{1}{2} \pm \frac{\sqrt{55}}{10}i$ D) $-\frac{1}{2} \pm \frac{\sqrt{55}}{10}$

Solve the inequality.

29) $x^2 - 5x \geq -4$ 29) _____

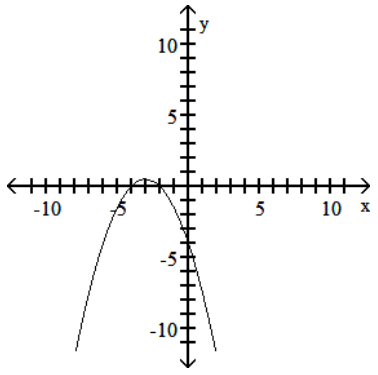
A) $(-\infty, 1]$ B) $[1, 4]$ C) $[4, \infty)$ D) $(-\infty, 1] \cup [4, \infty)$

Write a mathematical expression for the quantity described verbally.

30) The profit consists of a franchise fee of $100,000 plus 10% of all sales 30) _____

A) $100,000 - 0.1$ B) $10x + 100,000$ C) $0.1 + 100,000x$ D) $(0.1x + 100,000)$

Determine whether the graph is the graph of a function.

31) 

31) _____

A) Yes

B) No

Find the domain of the given function.

32) $f(x) = \frac{\sqrt{x + 5}}{(x + 8)(x - 4)}$

32) _____

A) $[-5, 4) \cup (4, \infty)$

B) All real numbers

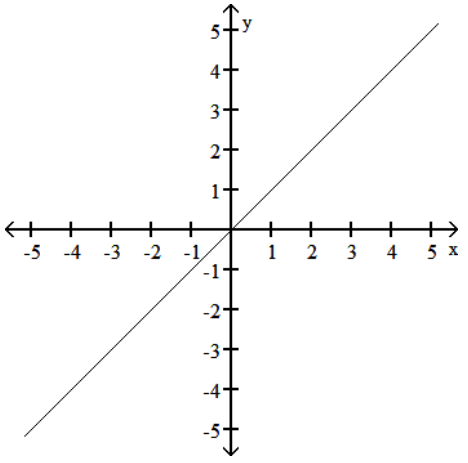
C) $(0, \infty)$

D) $(-\infty, -8) \cup (-8\ -5) \cup (-5, 4) \cup (4, \infty)$

Graph the function and determine if it has a point of discontinuity at x = 0. If there is a discontinuity, tell whether it is removable or non-removable.

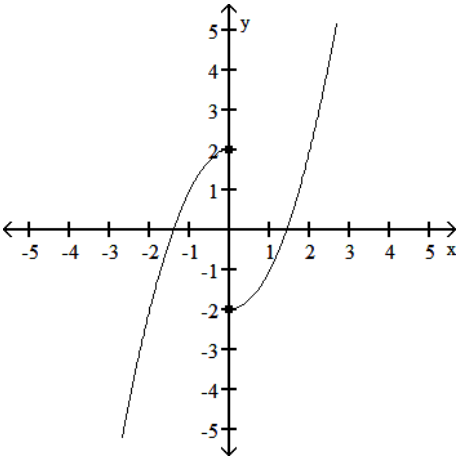
33) $f(x) = \frac{x^3 - 2x}{x}$ 33) _____

A)



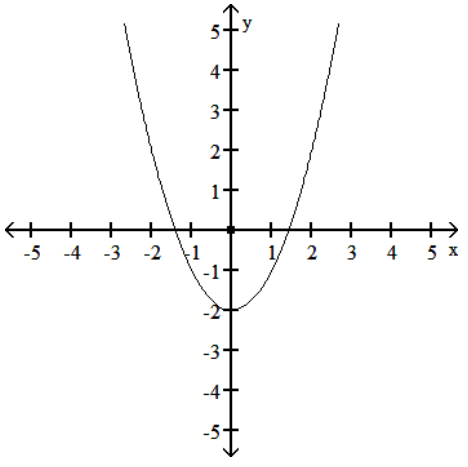
No

B)



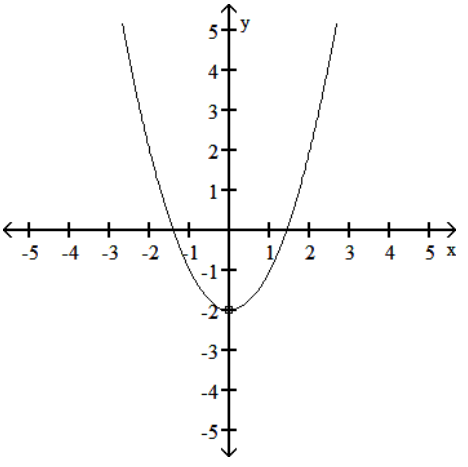
Yes; non-removable

C)



No

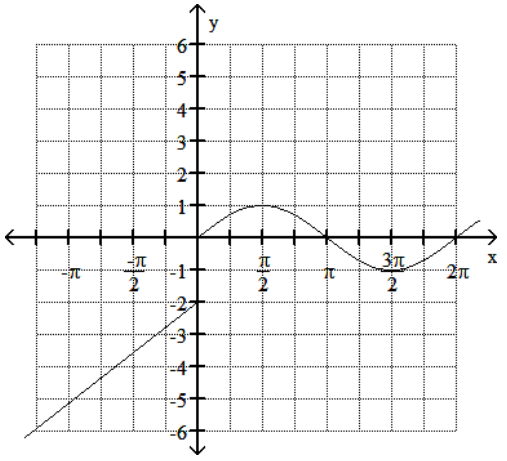
D)



Yes; removable

Solve the problem.

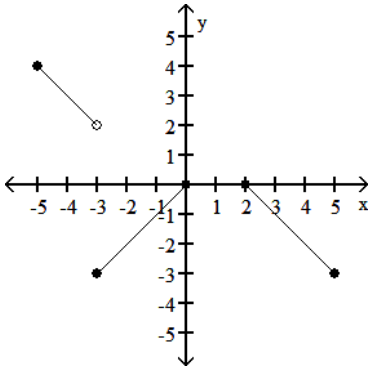
34) Use the graph of f to estimate the local maximum and local minimum. 34) _____



A) Local maximum: 1; local minimum: 0 and -1
B) Local maximum: 0 and 1; local minimum: 0 and -1
C) Local maximum: 1; local minimum: -1
D) Local maximum: 0 and 1; local minimum: -1

Determine the intervals on which the function is increasing, decreasing, and constant.

35) 35) _____



A) Increasing on (-3, 1); Decreasing on (-5, -3) and (0, 5); Constant on (1, 2)
B) Increasing on (-3, -1); Decreasing on (-5, -2) and (2, 4); Constant on (-1, 2)
C) Increasing on (-5, -3) and (2, 5); Decreasing on (-3, 0); Constant on (0, 2)
D) Increasing on (-3, 0); Decreasing on (-5, -3) and (2, 5); Constant on (0, 2)

Determine if the function is bounded above, bounded below, bounded on its domain, or unbounded on its domain.

36) $y = 5 - x^2$ 36) _____

A) Bounded above
B) Bounded below
C) Bounded domain
D) Unbounded

Find the asymptote(s) of the given function.

37) $f(x) = \frac{x - 1}{x^2 + 6x}$ vertical asymptotes(s) 37) _____

A) $x = 6$ B) $x = 1$ C) $x = 0, x = -6$ D) $x = -6$

Identify which of the twelve basic functions listed below fit the description given.

$y = x$, $y = x^2$, $y = x^3$, $y = |x|$, $y = \frac{1}{x}$, $y = e^x$, $y = \sqrt{x}$, $y = \ln x$, $y = \sin x$, $y = \cos x$, $y = \text{int}(x)$, $y = \frac{1}{1 + e^{-x}}$

38) The four functions with local minima 38) _____

A) $y = \sqrt{x}$, $y = \sin x$, $y = \cos x$, $y = x^2$ B) $y = x^2$, $y = x^3$, $y = \sin x$, $y = \cos x$

C) $y = \sin x$, $y = \cos x$, $y = |x|$, $y = \frac{1}{1 + e^{-x}}$ D) $y = x^2$, $y = \sin x$, $y = \cos x$, $y = |x|$

39) The three functions that are even 39) _____

A) $y = x$, $y = x^2$, $y = x^3$ B) $y = x$, $y = \frac{1}{x}$, $y = x^3$

C) $y = \cos x$, $y = \sin x$, $y = |x|$ D) $y = x^2$, $y = \cos x$, $y = |x|$

40) The one function that is decreasing from $(0, \infty)$ 40) _____

A) $y = |x|$ B) $y = \frac{1}{1 + e^{-x}}$ C) $y = \frac{1}{x}$ D) $y = \ln x$

Perform the requested operation or operations. Find the domain of each.

41) $f(x) = \sqrt{x + 6}$ and $g(x) = | x - 2 |$ 41) _____

Find fg.

A) $| x - 2 |\sqrt{x + 6}$; domain: $(-6, \infty)$ B) $| x - 2 |\sqrt{x + 6}$; domain: $(2, \infty)$

C) $| x^2 + 4x - 12 |$; domain: $(-\infty, \infty)$ D) $\sqrt{x^2 + 4x - 12}$; domain: $(-\infty, -6) \cup (2, \infty)$

Perform the requested operation or operations.

42) $f(x) = \frac{1}{x - 4}$; $g(x) = \sqrt{x}$ 42) _____

Find f(g(x)).

A) $f(g(x)) = \frac{1}{\sqrt{x} - 4}$ B) $f(g(x)) = \sqrt{\frac{1}{x - 4}}$

C) $f(g(x)) = \frac{\sqrt{x}}{x - 4}$ D) $f(g(x)) = (x - 4)\sqrt{x}$

Find f(x) and g(x) so that the function can be described as y = f(g(x)).

43) $y = \sqrt{-26x^2 + 26}$ 43) _____

A) $f(x) = -26x^2 + 26$, $g(x) = \sqrt{x}$ B) $f(x) = \sqrt{x}$, $g(x) = -26x^2 + 26$

C) $f(x) = \sqrt{-26x^2}$, $g(x) = \sqrt{26}$ D) $f(x) = \sqrt{-26x + 26}$, $g(x) = x^2$

Find the inverse of the function.

44) $f(x) = x^3 - 8$ 44) _____

A) $f^{-1}(x) = \sqrt[3]{x - 8}$

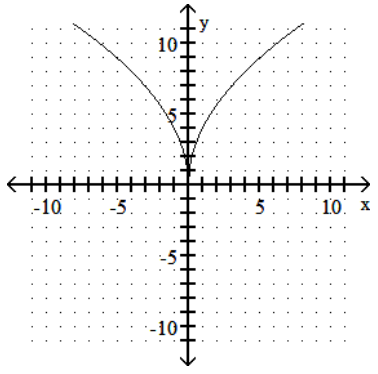
B) $f^{-1}(x) = \sqrt[3]{x + 8}$

C) Not a one-to-one function

D) $f^{-1}(x) = \sqrt[3]{x} + 8$

Determine if the function is one-to-one.

45) 45) _____



A) No

B) Yes

Fill in the blanks to complete the statement.

46) The graph of $y = -6x^3 + 4$ can be obtained from the graph of $y = x^3$ by vertically stretching by a factor of ?; reflecting across the ? -axis, and shifting vertically ? units in the ? direction. 46) _____

A) 6; y; 4; upward

B) 4; x; 6; upward

C) -6; x; 4; downward

D) 6; x; 4; upward

Write an equation for the quadratic function whose graph contains the given vertex and point.

47) Vertex (-3, -5), point (-6, 22) 47) _____

A) $P(x) = 3x^2 + 18x + 22$

B) $P(x) = 3x^2 + 3x + 5$

C) $P(x) = -3x^2 + 18x + 5$

D) $P(x) = -6x^2 - 18x - 22$

Solve the problem.

48) A projectile is thrown upward so that its distance above the ground after t seconds is $h = -16t^2 + 608t$. After how many seconds does it reach its maximum height? 48) _____

A) 28.5 s

B) 9 s

C) 38 s

D) 19 s

Write the statement as a power function equation. Use k as the constant of variation.

49) The area of an equilateral triangle varies directly as the square of the side s. 49) _____

A) $A = \frac{k}{s^2}$

B) $A = \frac{s^2}{k}$

C) $A = k^2 s$

D) $A = ks^2$

50) John kept track of the time it took him to drive to college from his home and the speed at which he drove. He found that the time t varies inversely as the speed r. 50) _____

A) $r = kt$

B) $t = \frac{k}{r}$

C) $t = kr$

D) $t = \frac{r}{k}$

Data are given for y as a power function of x. Write an equation for the power function, and state its power and constant of variation.

51)

x	1	8	27	64	125	216
y	2	4	6	8	10	12

51) _____

A) $y = 0.5x$; Power = 1; constant of variation = 0.5

B) $y = \sqrt{x}$; Power = $\frac{1}{2}$; constant of variation = 1

C) $y = 2\sqrt[3]{x}$; Power = -3; constant of variation = 2

D) $y = 2\sqrt[3]{x}$; Power = $\frac{1}{3}$; constant of variation = 2

Solve the problem. Round as appropriate.

52) The intensity I of light varies inversely as the square of the distance D from the source. If the intensity of illumination on a screen 5 ft from a light is 3 foot-candles, find the intensity on a screen 20 ft from the light. 52) _____

A) 3/16 foot-candle
B) 3/17 foot-candle
C) 1 3/16 foot-candles
D) 2 foot-candles

53) The gravitational attraction A between two masses varies inversely as the square of the distance between them. The force of attraction is 2.25 lb when the masses are 4 ft apart, what is the attraction when the masses are 6 ft apart? 53) _____

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

Use a graphing calculator to approximate the real zeros of the function defined by f(x). Express decimal approximations to the nearest hundredth.

54) $f(x) = x^4 - 3.10x^3 + 0.06x^2 + 4.55x - 1.18$ 54) _____

A) -1.14, 2.33, -0.27
B) 1.14, 1.64, 2.33, -0.27
C) -1.14, 1.64, 2.33, 0.27
D) -1.64, -0.27

Find the zeros of the polynomial function and state the multiplicity of each.

55) $f(x) = 5(x + 7)^2(x - 7)^3$ 55) _____

A) -7, multiplicity 2; 7, multiplicity 3
B) -7, multiplicity 3; 7, multiplicity 2
C) 4, multiplicity 1; -7, multiplicity 3; 7, multiplicity 3
D) 4, multiplicity 1; 7, multiplicity 1; -7, multiplicity 1

Divide using either method and write a summary statement in fraction form.

56) $\frac{2x^5 - x^4 + 3x^2 - x + 5}{x - 1}$ 56) _____

A) $2x^4 + x^3 + x^2 + 4x + 3 + \frac{8}{x + 1}$
B) $2x^4 + x^3 - x^2 + 2x + 1 + \frac{6}{x + 1}$
C) $2x^4 + x^3 + 4x^2 + 3x + \frac{8}{x + 1}$
D) $2x^4 - 3x^3 + x + \frac{6}{x + 1}$

Divide using synthetic division, and write a summary statement in fraction form.

57) $\frac{2x^4 - x^3 - 15x^2 + 3x}{x + 3}$ 57) _____

A) $2x^3 - 5x^2 + 3 + \frac{-9}{x + 3}$

B) $2x^3 - 7x^2 + 6x - 15 + \frac{45}{x + 3}$

C) $2x^3 + 5x^2 + 3 + \frac{9}{x + 3}$

D) $2x^3 - 7x^2 + 6x - 15 + \frac{-45}{x + 3}$

Find the remainder when f(x) is divided by (x - k)

58) $f(x) = 7x^4 + 12x^3 + 6x^2 - 5x + 16; k = 3$ 58) _____

A) 1704 B) 946 C) 2512 D) 188

59) $f(x) = 2x^4 + 7x^3 + 8x^2 + 4x - 3; k = -3$ 59) _____

A) 30 B) -150 C) 294 D) 558

Use the Factor Theorem to determine whether the first polynomial is a factor of the second polynomial.

60) $x + 3; 5x^3 + 13x^2 - 7x + 3$ 60) _____

A) No B) Yes

Use the Rational Zeros Theorem to write a list of all potential rational zeros

61) $f(x) = -2x^4 + 4x^3 + 3x^2 + 18$ 61) _____

A) $\pm 1, \pm 2, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{1}{6}, \pm \frac{1}{9}, \pm \frac{1}{18}$

B) $\pm 1, \pm \frac{1}{2}, \pm 2, \pm 3, \pm 6, \pm 9, \pm 18$

C) $\pm 1, \pm 2, \pm 3, \pm 6, \pm 9, \pm 18$

D) $\pm 1, \pm \frac{1}{2}, \pm 2, \pm 3, \pm \frac{3}{2}, \pm 6, \pm 9, \pm \frac{9}{2}, \pm 18$

62) $f(x) = 13x^3 + 23x^2 + 2x - 26$ 62) _____

A) $\pm 1, \pm \frac{1}{13}, \pm 2, \pm \frac{2}{13}, \pm 13, \pm 26$

B) $\pm 1, \pm \frac{1}{2}, \pm 13, \pm \frac{13}{2}, \pm \frac{1}{13}, \pm \frac{1}{26}$

C) $\pm 1, \pm 2, \pm 13, \pm 26$

D) $\pm 1, \pm \frac{1}{13}, \pm 2, \pm 13, \pm 26$

Solve the equation.

63) $\frac{x + 2}{7} - \frac{x - 5}{4} = 3$ 63) _____

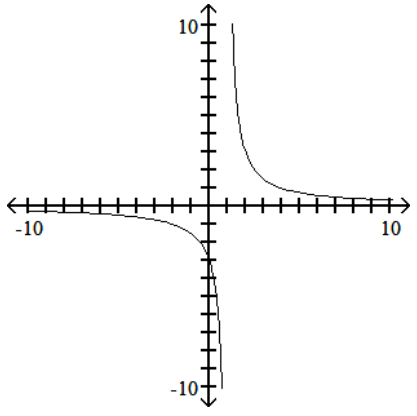
A) $x = -3$ B) $x = 127$ C) $x = 111$ D) $x = -\frac{41}{3}$

64) $x + 3 = \frac{10}{x}$ 64) _____

A) $x = \pm\sqrt{10}$ B) $x = -2$ or $x = 5$ C) $x = -3$ D) $x = -5$ or $x = 2$

Evaluate the limit based on the graph of f shown.

65) 65) _____



$\lim_{x \to 1^+} f(x)$

A) 0 B) 1 C) ∞ D) $-\infty$

Use limits to describe the behavior of the rational function near the indicated asymptote.

66) $f(x) = \dfrac{3}{x - 4}$ 66) _____

Describe the behavior of the function near its vertical asymptote.

A) $\lim\limits_{x \to -4^-} f(x) = -\infty$, $\lim\limits_{x \to -4^+} f(x) = \infty$

B) $\lim\limits_{x \to 4^-} f(x) = -\infty$, $\lim\limits_{x \to 4^+} f(x) = \infty$

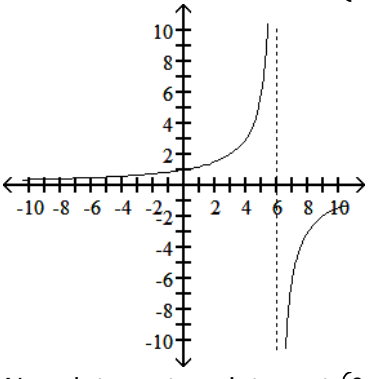
C) $\lim\limits_{x \to 4^-} f(x) = \infty$, $\lim\limits_{x \to 4^+} f(x) = -\infty$

D) $\lim\limits_{x \to -4^-} f(x) = \infty$, $\lim\limits_{x \to -4^+} f(x) = \infty$

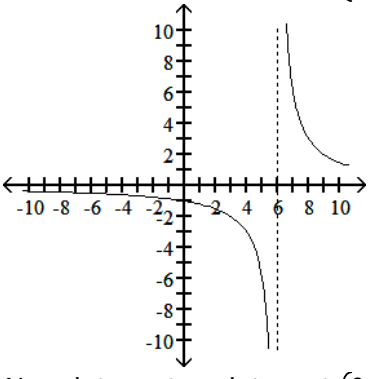
List the x- and y-intercepts, and graph the function.

67) $f(x) = \dfrac{-6}{x - 6}$ 67) _____

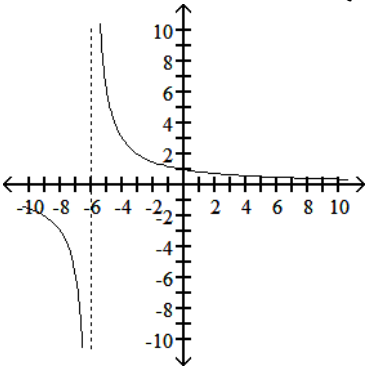
A) No x-intercepts, y-intercept: $(0, 1)$;



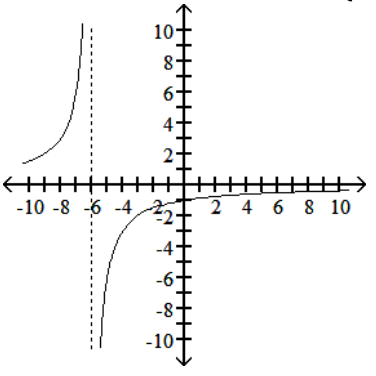
B) No x-intercepts, y-intercept: $(0, -1)$;



C) No x-intercepts, y-intercept: $(0, 1)$;



D) No x-intercepts, y-intercept: $(0, -1)$;



Solve the problem.

68) The profit made when t units are sold, $t > 0$, is given by $P = t^2 - 34t + 288$. Determine the number of units to be sold in order for $P < 0$ (a loss is taken). 68) _____

A) $16 < t < 18$ B) $t < 16$ or $t > 18$ C) $t = 16$ or $t = 18$ D) $t > 0$

Find the exponential function that satisfies the given conditions.

69) Initial mass = 415 g, halving once every 23 hours 69) _____

A) $m(t) = 415 \cdot 2^{23t}$

B) $m(t) = 415 \cdot 2^{t/23}$

C) $m(t) = 415 \cdot \left(\frac{1}{2}\right)^{t/23}$

D) $m(t) = 415 \cdot \left(\frac{1}{2}\right)^{23t}$

Solve the problem.

70) Suppose the amount of a radioactive element remaining in a sample of 100 milligrams after x years can be described by $A(x) = 100e^{-0.01232x}$. How much is remaining after 288 years? Round the answer to the nearest hundredth of a milligram. 70) _____

A) 2.88 milligrams

B) 0.03 milligrams

C) 3474.93 milligrams

D) 354.82 milligrams

Find the exponential function that satisfies the given conditions.

71) Initial value = 64, decreasing at a rate of 0.5% per week 71) _____

A) $f(t) = 64 \cdot 0.995^t$ B) $f(t) = 0.5 \cdot 0.36^t$ C) $f(t) = 64 \cdot 1.5^t$ D) $f(t) = 64 \cdot 1.005^t$

Decide whether the function is an exponential growth or exponential decay function and find the constant percentage rate of growth or decay.

72) $f(x) = 8.7 \cdot 1.026^x$ 72) _____

A) Exponential growth function; 102.6%

B) Exponential decay function; 0.026%

C) Exponential growth function; 2.6%

D) Exponential growth function; 0.026%

Find the following using a calculator. Round to four decimal places.

73) log 93,200 73) _____

A) 4.9694 B) 6.8372 C) 6.8374 D) 6.8376

Simplify the expression.

74) $e^{\ln 5}$ 74) _____

A) 5 B) $\frac{1}{5}$ C) ln 5 D) e^5

Evaluate the logarithm.

75) $\log_{22} \sqrt{22}$ 75) _____

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

Describe how to transform the graph of the basic function g(x) into the graph of the given function f(x).

76) $f(x) = \ln (x + 8) - 5$; $g(x) = \ln x$ 76) _____

A) Translate 8 units to the left and 5 units down.
B) Translate 8 units to the right and 5 units down.
C) Translate 8 units to the left and 5 units up.
D) Translate 5 units to the left and 8 units up.

Use the product, quotient, and power rules of logarithms to rewrite the expression as a single logarithm. Assume that all variables represent positive real numbers.

77) $3 \log_m x - 4 \log_m p^2$ 77) _____

A) $\log_m \frac{x^3}{2p^4}$ B) $\log_m \frac{x^3}{p^6}$ C) $\log_m \frac{3x}{4p^2}$ D) $\log_m \frac{x^3}{p^8}$

Assuming all variables are positive, use properties of logarithms to write the expression as a sum or difference of logarithms or multiples of logarithms.

78) $\log_{16}\left(\frac{9\sqrt{r}}{s}\right)$ 78) _____

A) $\log_{16} 9 \cdot \frac{1}{2} \log_{16} r \div \log_{16} s$ B) $\log_{16} s - \log_{16} 9 - \frac{1}{2} \log_{16} r$

C) $\log_{16} (9\sqrt{r}) - \log_{16} s$ D) $\log_{16} 9 + \frac{1}{2} \log_{16} r - \log_{16} s$

Use the change of base rule to find the logarithm to four decimal places.

79) $\log_{\sqrt{7}} 144.8$ 79) _____

A) 0.4225 B) 5.1137 C) 2.5568 D) 0.1956

Solve the problem.

80) The Richter scale magnitude R of an earthquake is based on the features of the associated seismic wave and is measured by $R = \log (a/T) + B$, where a is the amplitude in μm (micrometers), T is the period in seconds, and B accounts for the weakening of the seismic wave due to the distance from the epicenter. Compute the earthquake magnitude R when a = 220, T = 2, and B = 3.5. (Round to the nearest ten-thousandth.) 80) _____

A) 2.0414 B) 1.4586 C) 5.5414 D) 9.0414

Use a calculator to find an approximate solution to the equation.

81) $2e^{5x - 2} = 10$ 81) _____

A) 2.400 B) 0.630 C) 0.722 D) -0.078

Solve the equation by changing it to exponential form.

82) $\log_2 x = -4$ 82) _____

A) $x = -(4)^2$ B) $x = \frac{1}{2^4}$ C) $x = -2 \cdot 4$ D) $x = -\frac{4}{\log_2 4}$

Find the exact solution to the equation.

83) $5 \ln (x - 7) = 1$ 83) _____

A) $x = e^5 + 7$ B) $x = e^{1/5} - 7$ C) $x = 5e + 7$ D) $x = e^{1/5} + 7$

Convert the angle to decimal degrees and round to the nearest hundredth of a degree.

84) 57°29′38″ 84) _____

A) 57.45° B) 57.49° C) 57.50° D) 57.55°

Convert the angle to degrees, minutes, and seconds.

85) 301.51° 85) _____

A) 301°30′51″ B) 301°35′51″ C) 301°30′36″ D) 301°31′35″

86) 232.21° 86) _____

A) 232°35′21″ B) 232°12′36″ C) 232°13′35″ D) 232°12′21″

Convert from degrees to radians. Use the value of π found on a calculator and round answers to four decimal places, as needed.

87) 324° 87) _____

A) $\frac{8\pi}{5}$ B) $\frac{9\pi}{5}$ C) $\frac{9\pi}{10}$ D) $\frac{18\pi}{5}$

Convert the radian measure to degree measure. Use the value of π found on a calculator and round answers to two decimal places.

88) $-\frac{19}{6}\pi$ 88) _____

A) -285° B) -1140π° C) -9.94° D) -570°

Use the arc length formula and the given information to find the indicated quantity.

89) s = 9.8 ft, $\theta = \frac{\pi}{3}$ rad; find r 89) _____

A) 29.4π ft B) $\frac{\pi}{29.4}$ ft C) 58.8π ft D) $\frac{29.4}{\pi}$ ft

90) r = 15 ft, θ = 35°; find s 90) _____

A) $\frac{35}{12}\pi$ ft B) 1050 ft C) 525 ft D) $\frac{35}{24}\pi$ ft

Find the angle in degrees that describes the compass bearing.

91) NW 91) _____

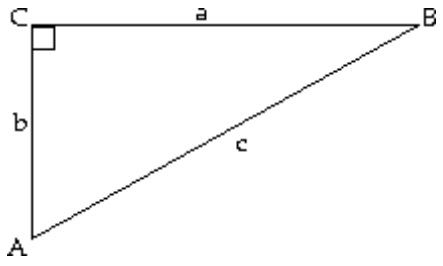
A) 292.5° B) 270° C) 337.5° D) 315°

92) ENE 92) _____

A) 90° B) 67.5° C) 45° D) 22.5°

Solve the right triangle for all missing sides and angles to the nearest tenth.

93) 93) _____



c = 19

A = 50°

A) B = 40°, a = 12.2, b = 14.6

B) B = 40°, a = 22.6, b = 14.6

C) B = 40°, a = 14.6, b = 12.2

D) B = 40°, a = 12.2, b = 22.6

Solve the problem.

94) From a distance of 1207 feet from a spotlight, the angle of elevation to a cloud base is 43°. Find the height of the cloud base to the nearest foot. 94) _____

A) 883 feet B) 823 feet C) 1294 feet D) 1126 feet

Find the measures of two angles, one positive and one negative, that are coterminal with the given angle.

95) -210° 95) _____

A) 150°; -570° B) 150°; -390° C) 60°; -480° D) -750°; -570°