Chapter # 2 HW Section:______________, Date:______________Name___________________________________

Find the average velocity of the function over the given interval.

1) $y = x^2 + 8x$, [5, 8]

A) $\frac{128}{3}$ B) 16 C) $\frac{63}{8}$ D) 21

2) $y = \sqrt{2x}$, [2, 8]

A) 2 B) $\frac{1}{3}$ C) 7 D) $-\frac{3}{10}$

3) $y = 4x^2, \left[0, \frac{7}{4}\right]$

A) 7 B) $-\frac{3}{10}$ C) $\frac{1}{3}$ D) 2

4) $g(t) = 3 + \tan t, \left[-\frac{\pi}{4}, \frac{\pi}{4}\right]$

A) $-\frac{4}{\pi}$ B) $-\frac{8}{5}$ C) 0 D) $\frac{4}{\pi}$

Use the table to find the instantaneous velocity of y at the specified value of x.

5) x = 1.

x	y
0	0
0.2	0.02
0.4	0.08
0.6	0.18
0.8	0.32
1.0	0.5
1.2	0.72
1.4	0.98

A) 2 B) 0.5 C) 1 D) 1.5

6) x = 1.

x	y
0.900	-0.05263
0.990	-0.00503
0.999	-0.0005
1.000	0.0000
1.001	0.0005
1.010	0.00498
1.100	0.04762

A) 0.5 B) −0.5 C) 1 D) 0

For the given position function, make a table of average velocities and make a conjecture about the instantaneous velocity at the indicated time.

7) $s(t) = t^2 + 8t - 2$ at $t = 2$

t	1.9	1.99	1.999	2.001	2.01	2.1
s(t)						

A)

t	1.9	1.99	1.999	2.001	2.01	2.1
s(t)	16.692	17.592	17.689	17.710	17.808	18.789

; instantaneous velocity is 17.70

B)

t	1.9	1.99	1.999	2.001	2.01	2.1
s(t)	16.810	17.880	17.988	18.012	18.120	19.210

; instantaneous velocity is 18.0

C)

t	1.9	1.99	1.999	2.001	2.01	2.1
s(t)	5.043	5.364	5.396	5.404	5.436	5.763

; instantaneous velocity is ∞

D)

t	1.9	1.99	1.999	2.001	2.01	2.1
s(t)	5.043	5.364	5.396	5.404	5.436	5.763

; instantaneous velocity is 5.40

Solve the problem.

8) Given $\lim_{x \to 0^-} f(x) = L_l$, $\lim_{x \to 0^+} f(x) = L_r$, and $L_l \neq L_r$, which of the following statements is true?

I. $\lim_{x \to 0} f(x) = L_l$

II. $\lim_{x \to 0} f(x) = L_r$

III. $\lim_{x \to 0} f(x)$ does not exist.

A) III B) none C) I D) II

9) Given $\lim_{x \to 0^-} f(x) = L_l$, $\lim_{x \to 0^+} f(x) = L_r$, and $L_l = L_r$, which of the following statements is false?

I. $\lim_{x \to 0} f(x) = L_l$

II. $\lim_{x \to 0} f(x) = L_r$

III. $\lim_{x \to 0} f(x)$ does not exist.

A) II B) none C) III D) I

10) What conditions, when present, are sufficient to conclude that a function f(x) has a limit as x approaches some value of a?

A) f(a) exists, the limit of f(x) as $x \to a$ from the left exists, and the limit of f(x) as $x \to a$ from the right exists.

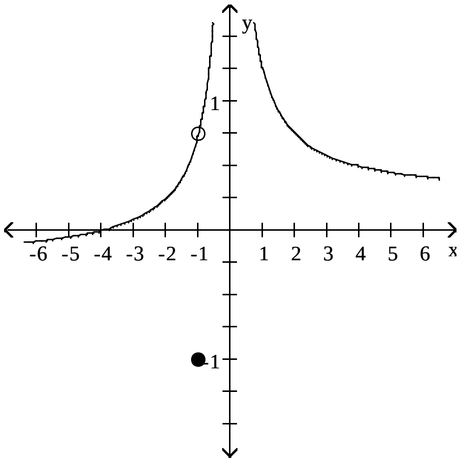
B) The limit of f(x) as $x \to a$ from the left exists, the limit of f(x) as $x \to a$ from the right exists, and these two limits are the same.

C) The limit of f(x) as $x \to a$ from the left exists, the limit of f(x) as $x \to a$ from the right exists, and at least one of these limits is the same as f(a).

D) Either the limit of f(x) as $x \to a$ from the left exists or the limit of f(x) as $x \to a$ from the right exists

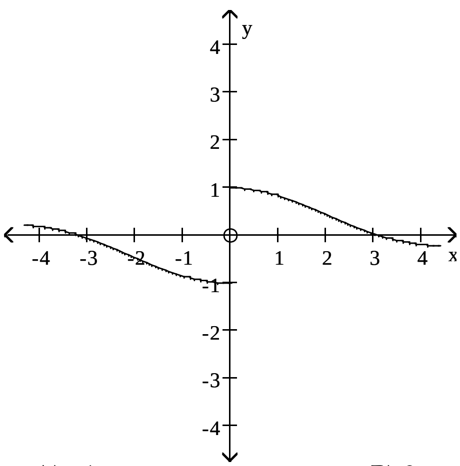
Use the graph to evaluate the limit.

11) $\lim_{x \to -1} f(x)$



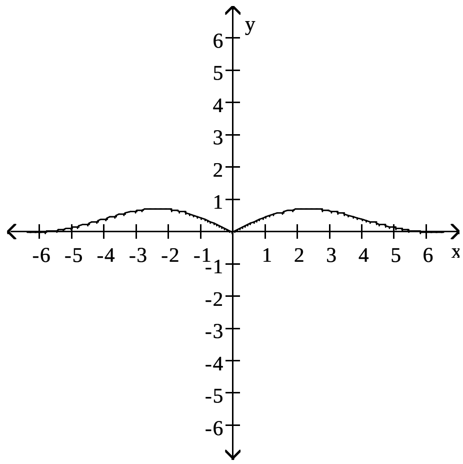
A) $\frac{3}{4}$ B) -1 C) $-\frac{3}{4}$ D) ∞

12) $\lim_{x \to 0} f(x)$



A) -1 B) 0 C) does not exist D) 1

13) $\lim_{x \to 0} f(x)$



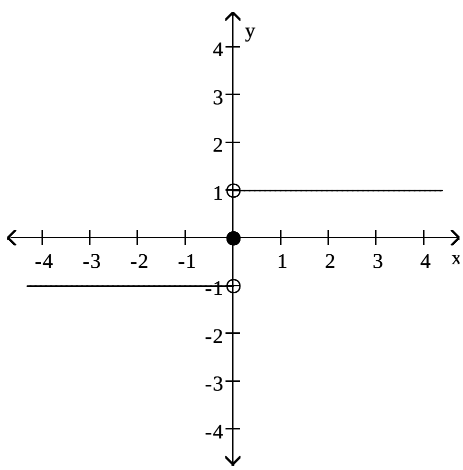
A) 0

B) does not exist

C) –1

D) 1

14) $\lim_{x \to 0} f(x)$



A) –1

B) does not exist

C) ∞

D) 1

Use the table of values of f to estimate the limit.

15) Let $f(x) = \dfrac{\sin(6x)}{x}$, find $\lim_{x \to 0} f(x)$.

x	-0.1	-0.01	-0.001	0.001	0.01	0.1
f(x)		5.99640065			5.99640065	

A) limit = 0

B) limit does not exist

C) limit = 5.5

D) limit = 6

16) Let $f(x) = x^2 + 8x - 2$, find $\lim_{x \to 2} f(x)$.

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)						

A)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	5.043	5.364	5.396	5.404	5.436	5.763

; limit = 5.40

B)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	16.692	17.592	17.689	17.710	17.808	18.789

; limit = 17.70

C)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	16.810	17.880	17.988	18.012	18.120	19.210

; limit = 18.0

D)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	5.043	5.364	5.396	5.404	5.436	5.763

; limit = ∞

17) Let $f(x) = \dfrac{x - 4}{x^2 - 5x + 4}$, find $\lim_{x \to 4} f(x)$.

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)						

A)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	0.4448	0.4344	0.4334	0.4332	0.4322	0.4226

; limit = 0.4333

B)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	0.2448	0.2344	0.2334	0.2332	0.2322	0.2226

; limit = 0.2333

C)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	0.3448	0.3344	0.3334	0.3332	0.3322	0.3226

; limit = 0.3333

D)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	−0.3448	−0.3344	−0.3334	−0.3332	−0.3322	−0.3226

; limit = −0.3333

18) Let $f(x) = \frac{x - 4}{\sqrt{x} - 2}$, find $\lim_{x \to 4} f(x)$.

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)						

A)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	5.07736	5.09775	5.09978	5.10022	5.10225	5.12236

; limit = 5.10

B)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	3.97484	3.99750	3.99975	4.00025	4.00250	4.02485

; limit = 4.0

C)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	1.19245	1.19925	1.19993	1.20007	1.20075	1.20745

; limit = ∞

D)

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)	1.19245	1.19925	1.19993	1.20007	1.20075	1.20745

; limit = 1.20

Provide an appropriate response.

19) Write the formal notation for the principle "the limit of a quotient is the quotient of the limits" and include a statement of any restrictions on the principle.

A) If $\lim_{x \to a} g(x) = M$ and $\lim_{x \to a} f(x) = L$, then $\lim_{x \to a} \frac{g(x)}{f(x)} = \frac{\lim_{x \to a} g(x)}{\lim_{x \to a} f(x)} = \frac{M}{L}$, provided that $L \neq 0$.

B) $\lim_{x \to a} \frac{g(x)}{f(x)} = \frac{g(a)}{f(a)}$, provided that $f(a) \neq 0$.

C) $\lim_{x \to a} \frac{g(x)}{f(x)} = \frac{g(a)}{f(a)}$.

D) If $\lim_{x \to a} g(x) = M$ and $\lim_{x \to a} f(x) = L$, then $\lim_{x \to a} \frac{g(x)}{f(x)} = \frac{\lim_{x \to a} g(x)}{\lim_{x \to a} f(x)} = \frac{M}{L}$, provided that $f(a) \neq 0$.

20) Provide a short sentence that summarizes the general limit principle given by the formal notation $\lim_{x \to a} [f(x) \pm g(x)] = \lim_{x \to a} f(x) \pm \lim_{x \to a} g(x) = L \pm M$, given that $\lim_{x \to a} f(x) = L$ and $\lim_{x \to a} g(x) = M$.

A) The sum or the difference of two functions is the sum of two limits.
B) The limit of a sum or a difference is the sum or the difference of the limits.
C) The sum or the difference of two functions is continuous.
D) The limit of a sum or a difference is the sum or the difference of the functions.

21) The statement "the limit of a constant times a function is the constant times the limit" follows from a combination of two fundamental limit principles. What are they?

A) The limit of a constant is the constant, and the limit of a product is the product of the limits.
B) The limit of a function is a constant times a limit, and the limit of a constant is the constant.
C) The limit of a product is the product of the limits, and a constant is continuous.
D) The limit of a product is the product of the limits, and the limit of a quotient is the quotient of the limits.

Find the limit.

22) $\lim\limits_{x \to 7} \sqrt{3}$

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

23) $\lim\limits_{x \to -4} (6x - 1)$

A) 25 B) -25 C) 23 D) -23

Give an appropriate answer.

24) Let $\lim\limits_{x \to 6} f(x) = 4$ and $\lim\limits_{x \to 6} g(x) = 5$. Find $\lim\limits_{x \to 6} [f(x) - g(x)]$.

A) 4 B) 9 C) 6 D) -1

25) Let $\lim\limits_{x \to -3} f(x) = 10$ and $\lim\limits_{x \to -3} g(x) = 4$. Find $\lim\limits_{x \to -3} \dfrac{f(x)}{g(x)}$.

A) $\dfrac{5}{2}$ B) $\dfrac{2}{5}$ C) 6 D) -3

26) Let $\lim\limits_{x \to 4} f(x) = -4$ and $\lim\limits_{x \to 4} g(x) = 2$. Find $\lim\limits_{x \to 4} [f(x) + g(x)]^2$.

A) -2 B) 20 C) -6 D) 4

Find the limit.

27) $\lim\limits_{x \to 2} (x^3 + 5x^2 - 7x + 1)$

A) does not exist B) 29 C) 15 D) 0

28) $\lim\limits_{x \to 0} \dfrac{x^3 - 6x + 8}{x - 2}$

A) -4 B) 4 C) 0 D) Does not exist

Determine the limit by sketching an appropriate graph.

29) $\lim\limits_{x \to 5^-} f(x)$, where $f(x) = \begin{cases} -4x + 2 & \text{for } x < 5 \\ 2x + 3 & \text{for } x \geq 5 \end{cases}$

A) 4 B) -18 C) 13 D) 3

30) $\lim\limits_{x \to 2^+} f(x)$, where $f(x) = \begin{cases} -5x - 3 & \text{for } x < 2 \\ 3x - 2 & \text{for } x \geq 2 \end{cases}$

A) 4 B) -2 C) -13 D) -1

31) $\lim\limits_{x \to -4^+} f(x)$, where $f(x) = \begin{cases} x^2 + 2 & \text{for } x \neq -4 \\ 0 & \text{for } x = -4 \end{cases}$

A) 14 B) 18 C) 16 D) 0

Find the limit, if it exists.

32) $\lim_{x \to 0} \dfrac{x^3 + 12x^2 - 5x}{5x}$

A) 0　B) 5　C) –1　D) Does not exist

33) $\lim_{x \to 1} \dfrac{x^4 - 1}{x - 1}$

A) Does not exist　B) 0　C) 4　D) 2

34) $\lim_{x \to -4} \dfrac{x^2 + 7x + 12}{x + 4}$

A) 56　B) 7　C) Does not exist　D) -1

35) $\lim_{h \to 0} \dfrac{(x + h)^3 - x^3}{h}$

A) $3x^2 + 3xh + h^2$　B) $3x^2$　C) 0　D) Does not exist

36) $\lim_{x \to 7} \dfrac{|7 - x|}{7 - x}$

A) 0　B) –1　C) 1　D) Does not exist

Provide an appropriate response.

37) It can be shown that the inequalities $-x \le x \cos\left(\dfrac{1}{x}\right) \le x$ hold for all values of $x \ge 0$.

Find $\lim_{x \to 0} x \cos\left(\dfrac{1}{x}\right)$ if it exists.

A) 1　B) 0.0007　C) does not exist　D) 0

Compute the values of f(x) and use them to determine the indicated limit.

38) If $f(x) = x^2 + 8x - 2$, find $\lim_{x \to 2} f(x)$.

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)						

A)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	5.043	5.364	5.396	5.404	5.436	5.763

; limit = ∞

B)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	5.043	5.364	5.396	5.404	5.436	5.763

; limit = 5.40

C)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	16.692	17.592	17.689	17.710	17.808	18.789

; limit = 17.70

D)

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	16.810	17.880	17.988	18.012	18.120	19.210

; limit = 18.0

Provide an appropriate response.

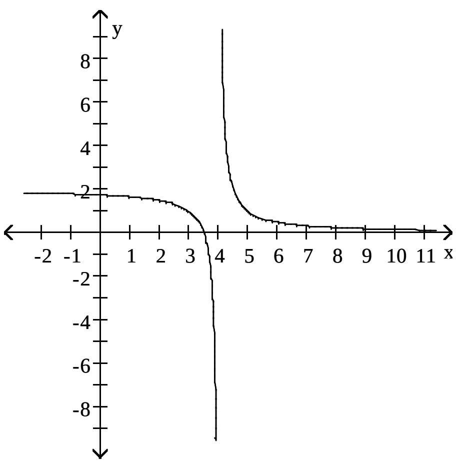
39) The inequality $1-\frac{x^2}{2} < \frac{\sin x}{x} < 1$ holds when x is measured in radians and $|x| < 1$.

Find $\lim_{x \to 0} \frac{\sin x}{x}$ if it exists.

A) 0 B) 1 C) does not exist D) 0.0007

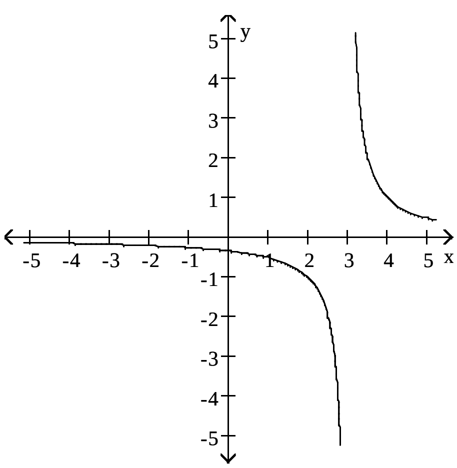
For the function f whose graph is given, determine the limit.

40) Find $\lim_{x \to 4^-} f(x)$ and $\lim_{x \to 4^+} f(x)$.



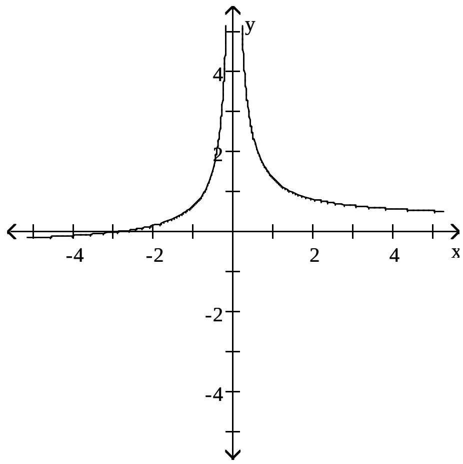
A) ∞, -∞ B) 4; 4 C) -4, 4 D) -∞, ∞

41) Find $\lim_{x \to 3} f(x)$.



A) ∞ B) does not exist C) 3 D) -∞

42) Find $\lim_{x \to 0} f(x)$.



A) 0 B) ∞ C) 1 D) $-\infty$

Find the limit.

43) $\lim_{x \to -2} \frac{1}{x + 2}$

A) 1/2 B) ∞ C) $-\infty$ D) Does not exist

44) $\lim_{x \to -9^+} \frac{1}{x + 9}$

A) $-\infty$ B) 0 C) ∞ D) -1

45) $\lim_{x \to 7^+} \frac{1}{(x - 7)^2}$

A) $-\infty$ B) -1 C) ∞ D) 0

46) $\lim_{x \to -5^-} \frac{6}{x^2 - 25}$

A) $-\infty$ B) 0 C) ∞ D) -1

47) $\lim_{x \to (\pi/2)^+} \tan x$

A) ∞ B) $-\infty$ C) 1 D) 0

48) $\lim_{x \to (-\pi/2)^-} \sec x$

A) $-\infty$ B) ∞ C) 0 D) 1

49) $\lim_{x \to 0^+} (1 + \csc x)$

A) 1 B) ∞ C) 0 D) Does not exist

50) $\lim_{x \to 0} (1 - \cot x)$

A) $-\infty$
B) 0
C) ∞
D) Does not exist

51) $\lim_{x \to -2^+} \dfrac{x^2 - 6x + 8}{x^3 - 4x}$

A) 0
B) Does not exist
C) ∞
D) $-\infty$

52) $\lim_{x \to 0} \dfrac{x^2 - 3x + 2}{x^3 - x}$

A) $-\infty$
B) Does not exist
C) ∞
D) 2

Find all vertical asymptotes of the given function.

53) $g(x) = \dfrac{9x}{x + 4}$

A) $x = -4$
B) none
C) $x = 9$
D) $x = 4$

54) $f(x) = \dfrac{x + 9}{x^2 - 36}$

A) $x = 36, x = -9$
B) $x = -6, x = 6$
C) $x = -6, x = 6, x = -9$
D) $x = 0, x = 36$

55) $g(x) = \dfrac{x + 9}{x^2 + 25}$

A) $x = -5, x = -9$
B) $x = -5, x = 5$
C) $x = -5, x = 5, x = -9$
D) none

Find the limit.

56) $\lim_{x \to \infty} \dfrac{3}{x} - 7$

A) -10
B) -4
C) -7
D) 7

57) $\lim_{x \to -\infty} \dfrac{8}{8 - (1/x^2)}$

A) $\dfrac{8}{7}$
B) 8
C) 1
D) $-\infty$

58) $\lim_{x \to -\infty} \dfrac{-7 + (6/x)}{7 - (1/x^2)}$

A) 1
B) $-\infty$
C) ∞
D) - 1

59) $\lim_{x \to \infty} \dfrac{x^2 + 7x + 3}{x^3 + 6x^2 + 4}$

A) $\dfrac{3}{4}$
B) ∞
C) 1
D) 0

60) $\lim\limits_{x \to -\infty} \dfrac{-12x^2 - 7x + 15}{-16x^2 + 3x + 7}$

A) 1 B) $\dfrac{15}{7}$ C) ∞ D) $\dfrac{3}{4}$

61) $\lim\limits_{x \to \infty} \dfrac{5x + 1}{16x - 7}$

A) $-\dfrac{1}{7}$ B) $\dfrac{5}{16}$ C) 0 D) ∞

62) $\lim\limits_{x \to -\infty} \dfrac{\cos 5x}{x}$

A) 0 B) $-\infty$ C) 1 D) 5

Divide numerator and denominator by the highest power of x in the denominator to find the limit.

63) $\lim\limits_{x \to \infty} \sqrt{\dfrac{25x^2}{6 + 9x^2}}$

A) $\dfrac{25}{9}$ B) $\dfrac{5}{3}$ C) $\dfrac{25}{6}$ D) does not exist

64) $\lim\limits_{x \to \infty} \sqrt{\dfrac{25x^2 + x - 3}{(x - 11)(x + 1)}}$

A) ∞ B) 0 C) 25 D) 5

65) $\lim\limits_{x \to \infty} \dfrac{-5\sqrt{x} + x^{-1}}{-4x - 5}$

A) 0 B) $\dfrac{5}{4}$ C) $\dfrac{1}{-4}$ D) ∞

66) $\lim\limits_{x \to \infty} \dfrac{-3x^{-1} - 2x^{-3}}{-2x^{-2} + x^{-5}}$

A) $\dfrac{3}{2}$ B) $-\infty$ C) 0 D) ∞

67) $\lim\limits_{x \to -\infty} \dfrac{\sqrt[3]{x} + 6x - 5}{2x + x^{2/3} - 7}$

A) 3 B) 0 C) $\dfrac{1}{3}$ D) $-\infty$

Find all horizontal asymptotes of the given function, if any.

68) $h(x) = \dfrac{6x - 8}{x - 5}$

A) $y = 6$
B) $y = 5$
C) $y = 0$
D) no horizontal asymptotes

69) $g(x) = \dfrac{x^2 + 1x - 8}{x - 8}$

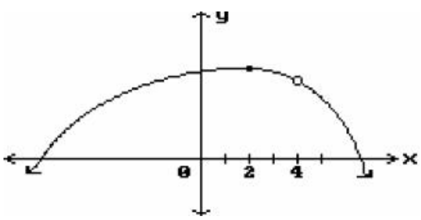
A) $y = 0$
B) $y = 1$
C) $y = 8$
D) no horizontal asymptotes

70) $h(x) = \dfrac{3x^4 - 7x^2 - 2}{6x^5 - 2x + 3}$

A) $y = \dfrac{7}{2}$
B) $y = 0$
C) $y = \dfrac{1}{2}$
D) no horizontal asymptotes

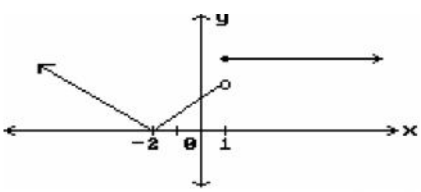
Find all points where the function is discontinuous.

71)



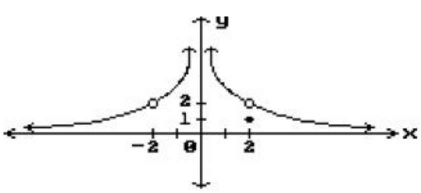
A) None
B) $x = 4$
C) $x = 2$
D) $x = 4, x = 2$

72)



A) $x = -2, x = 1$
B) $x = -2$
C) $x = 1$
D) None

73)

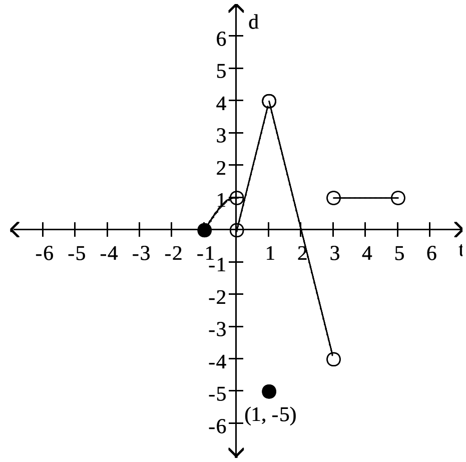


A) $x = 2$
B) $x = -2, x = 0$
C) $x = 0, x = 2$
D) $x = -2, x = 0, x = 2$

Provide an appropriate response.

74) Is f continuous at f(1)?

$$f(x) = \begin{cases} -x^2 + 1, & -1 \le x < 0 \\ 4x, & 0 < x < 1 \\ -5, & x = 1 \\ -4x + 8 & 1 < x < 3 \\ 1, & 3 < x < 5 \end{cases}$$

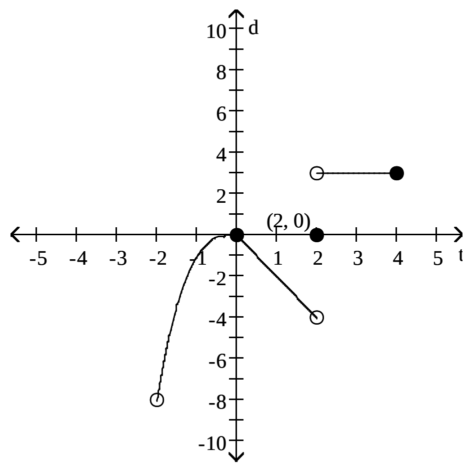


A) No

B) Yes

75) Is f continuous at x = 4?

$$f(x) = \begin{cases} x^3, & -2 < x \le 0 \\ -2x, & 0 \le x < 2 \\ 3, & 2 < x \le 4 \\ 0, & x = 2 \end{cases}$$



A) No

B) Yes

76) Is the function given by $f(x) = \dfrac{x + 2}{x^2 - 3x + 2}$ continuous at x = 1? Why or why not?

A) Yes, $\lim\limits_{x \to 1} f(x) = f(1)$

B) No, f(1) does not exist and $\lim\limits_{x \to 1} f(x)$ does not exist

77) Is the function given by $f(x) = \sqrt{10x + 10}$ continuous at x = - 1? Why or why not?

A) No, $\lim\limits_{x \to -1} f(x)$ does not exist

B) Yes, $\lim\limits_{x \to -1} f(x) = f\left(-1\right)$

78) Is the function given by $f(x) = \begin{cases} x^2 - 3, & \text{for } x < 0 \\ -4, & \text{for } x \ge 0 \end{cases}$ continuous at x = -3? Why or why not?

A) Yes, $\lim\limits_{x \to -3} f(x) = f(-3)$

B) No, $\lim\limits_{x \to -3} f(x) = f(-3)$ does not exist

Find the intervals on which the function is continuous.

79) $y = \dfrac{2}{x + 7} - 2x$

A) continuous everywhere
B) discontinuous only when $x = 7$
C) discontinuous only when $x = -7$
D) discontinuous only when $x = -9$

80) $y = \dfrac{1}{(x + 5)^2 + 10}$

A) continuous everywhere
B) discontinuous only when $x = -40$
C) discontinuous only when $x = -5$
D) discontinuous only when $x = 35$

Find the limit, if it exists.

81) $\lim\limits_{x \to 5} \sqrt{x^2 + 12x + 36}$

A) Does not exist
B) 11
C) ±11
D) 121

82) $\lim\limits_{x \to 2} \sqrt{x - 5}$

A) 0
B) Does not exist
C) -1.7320508
D) 1.73205081

Find numbers a and b, or k, so that f is continuous at every point.

83)

$$f(x) = \begin{cases} -4, & x < -4 \\ ax + b, & -4 \le x \le -3 \\ 5, & x > -3 \end{cases}$$

A) a = 9, b = 32
B) a = –4, b = 5
C) a = 9, b = -22
D) Impossible

84)

$$f(x) = \begin{cases} x^2, & x < -4 \\ ax + b, & -4 \le x \le 5 \\ x + 20, & x > 5 \end{cases}$$

A) a = 1, b = -20
B) a = 1, b = 20
C) a = -1, b = 20
D) Impossible

85)

$$f(x) = \begin{cases} x^2, & \text{if } x \le 4 \\ x + k, & \text{if } x > 4 \end{cases}$$

A) k = -4
B) k = 20
C) k = 12
D) Impossible

Solve the problem.

86) Select the correct statement for the definition of the limit: $\lim_{x \to x_0} f(x) = L$

means that ____________________

A) if given any number $\varepsilon > 0$, there exists a number $\delta > 0$, such that for all x, $0 < |x - x_0| < \delta$ implies $|f(x) - L| < \varepsilon$.

B) if given any number $\varepsilon > 0$, there exists a number $\delta > 0$, such that for all x, $0 < |x - x_0| < \varepsilon$ implies $|f(x) - L| < \delta$.

C) if given a number $\varepsilon > 0$, there exists a number $\delta > 0$, such that for all x, $0 < |x - x_0| < \delta$ implies $|f(x) - L| > \varepsilon$.

D) if given any number $\varepsilon > 0$, there exists a number $\delta > 0$, such that for all x, $0 < |x - x_0| < \varepsilon$ implies $|f(x) - L| > \delta$.

87) Identify the incorrect statements about limits.

I. The number L is the limit of f(x) as x approaches x_0 if f(x) gets closer to L as x approaches x_0.

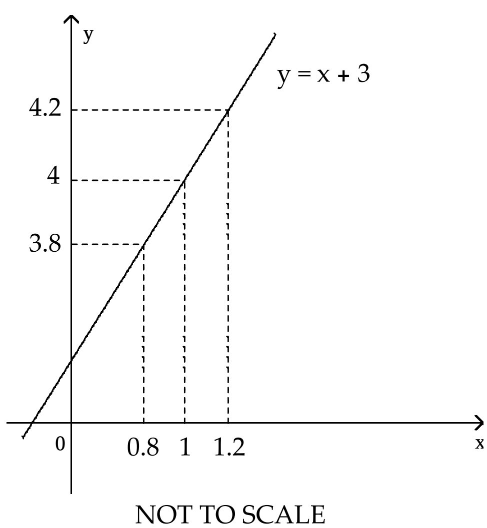
II. The number L is the limit of f(x) as x approaches x_0 if, for any $\varepsilon > 0$, there corresponds a $\delta > 0$ such that $|f(x) - L| < \varepsilon$ whenever $0 < |x - x_0| < \delta$.

III. The number L is the limit of f(x) as x approaches x_0 if, given any $\varepsilon > 0$, there exists a value of x for which $|f(x) - L| < \varepsilon$.

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

Use the graph to find a $\delta > 0$ such that for all x, $0 < |x - x_0| < \delta \Rightarrow |f(x) - L| < \varepsilon$.

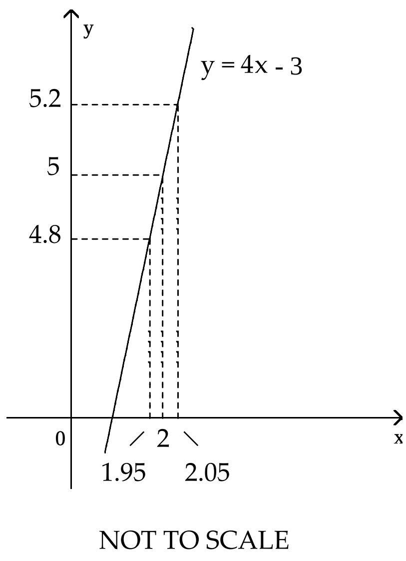
88)



$f(x) = x + 3$
$x_0 = 1$
$L = 4$
$\varepsilon = 0.2$

A) 0.2 B) 0.4 C) 0.1 D) 3

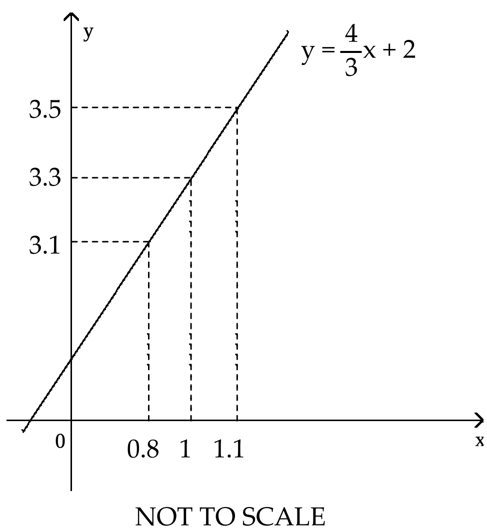
89)



$f(x) = 4x - 3$
$x_0 = 2$
$L = 5$
$\varepsilon = 0.2$

A) 0.1 B) 3 C) 0.05 D) 0.5

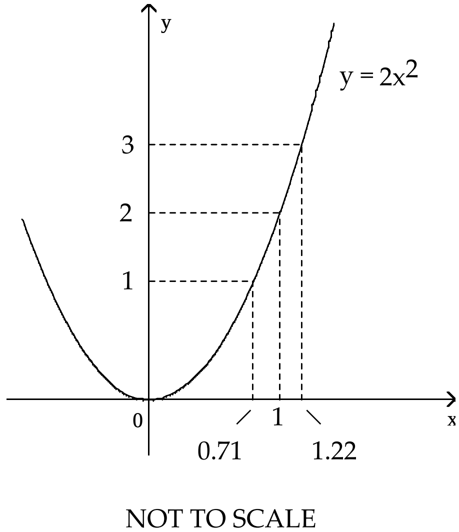
90)



$f(x) = \frac{4}{3}x + 2$
$x_0 = 1$
$L = 3.3$
$\varepsilon = 0.2$

A) 0.3 B) -0.3 C) 0.1 D) 2.3

91)



$f(x) = 2x^2$
$x_0 = 1$
$L = 2$
$\varepsilon = 1$

A) 0.22 B) 1 C) 0.51 D) 0.29

A function f(x), a point x_0, the limit of f(x) as x approaches x_0, and a positive number ε is given. Find a number δ > 0 such that for all x, $0 < |x - x_0| < \delta \Rightarrow |f(x) - L| < \varepsilon$.

92) $f(x) = 6x + 5$, $L = 17$, $x_0 = 2$, and $\varepsilon = 0.01$

A) 0.003333 B) 0.001667 C) 0.005 D) 0.008333

93) $f(x) = 7x - 2$, $L = 12$, $x_0 = 2$, and $\varepsilon = 0.01$

A) 0.000714 B) 0.002857 C) 0.001429 D) 0.005

94) $f(x) = -10x - 1$, $L = -11$, $x_0 = 1$, and $\varepsilon = 0.01$

A) 0.001 B) 0.0005 C) 0.002 D) -0.01