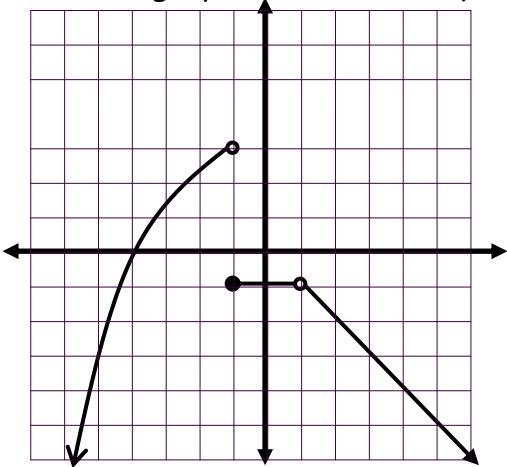


Calculus I
Chapter 2 Test Review

Use the graph to find the requested values.



1) $\lim_{x \rightarrow -1} f(x) =$

2) $\lim_{x \rightarrow 4} f(x) =$

3) $\lim_{x \rightarrow 1} f(x) =$

4) $\lim_{x \rightarrow \infty} f(x) =$

5) $\lim_{x \rightarrow -\infty} f(x) =$

6) $f(1) =$

7) $\lim_{x \rightarrow 3^+} f(x) =$

8) $f(-4) =$

9) $f(-1) =$

10) $\lim_{x \rightarrow 0} f(x) =$

Using the given piecewise function, find the requested values and justify your answers.

$$f(x) = \begin{cases} x^2 - 6x - 2 & \text{if } x \leq -1 \\ \frac{x^2 + 4}{x + 2} & \text{if } -1 < x \leq 3 \\ -2x + 5 & \text{if } x > 3 \end{cases}$$

11) $\lim_{x \rightarrow -1^-} f(x) =$

12) $\lim_{x \rightarrow -1^+} f(x) =$

13) $\lim_{x \rightarrow 1} f(x) =$

14) $\lim_{x \rightarrow 3} f(x) =$

15) $f(2) =$

16) $f(4) =$

17) $\lim_{x \rightarrow 4.5} f(x) =$

18) $f(-1) =$

19) $f(3) =$

20) $\lim_{x \rightarrow \infty} f(x) =$

Find the following limits.

21) $\lim_{x \rightarrow \infty} \frac{x^2 - 2x - 8}{x - 4} =$

22) $\lim_{x \rightarrow 4} \frac{x^2 - 2x - 8}{x - 4} =$

23) $\lim_{x \rightarrow 3} \frac{5x - 9}{x^2 - 5} =$

24) $\lim_{x \rightarrow \infty} \frac{2 - 6x - 3x^2}{2x^3 + 8x - 2} =$

25) $\lim_{x \rightarrow 2} \frac{5x}{x^2 + 3x - 10} =$

26) $\lim_{x \rightarrow 0} \frac{\sin x}{x} =$

27) $\lim_{x \rightarrow 1} \frac{x^2 + 9x - 10}{x^3 - 1} =$

28) $\lim_{x \rightarrow \infty} \frac{4x^3 - 6x^6 - 6}{5x^6 + 3x^3 - 5x^2} =$

29) $\lim_{x \rightarrow \infty} \frac{x - 6}{\sqrt{2x^2 + 5}} =$

30) $\lim_{x \rightarrow 1} \frac{x}{|x - 1|} =$

31) $\lim_{x \rightarrow 3} 9 =$

32) $\lim_{x \rightarrow -\infty} 4x - 6 =$

Determine if the following functions are continuous or not. If not, state its type discontinuity and where it occurs.

$$33) f(x) = \frac{x^3 + 27}{x + 3}$$

$$34) f(x) = \frac{x - 6}{x^2 - x - 6}$$

$$35) f(x) = \frac{2x - 6}{|x - 3|}$$

Determine whether the following piecewise function is continuous. Show all work that leads to your decision. (A sketch may be helpful in determining your answer)

$$36) f(x) = \begin{cases} -3 & x \leq -1 \\ x^3 & -1 < x < 2 \\ 2x + 4 & x \geq 2 \end{cases}$$

$$37) f(x) = \begin{cases} \frac{1}{x - 4} & x < 3 \\ 2x - 7 & x \geq 3 \end{cases}$$

For each of the following, find the value of 'a' that will make $f(x)$ continuous for all values of x .

$$38) f(x) = \begin{cases} ax + 1 & x < 2 \\ a + \sqrt{x + 14} & x \geq 2 \end{cases}$$

$$39) f(x) = \begin{cases} ax^2 - 2 & x \leq -6 \\ -5x - 8 & x > -6 \end{cases}$$

40) Graph a function that meets the following criteria. Assume the graph is continuous unless contradicted by the criteria.

$$\lim_{x \rightarrow -\infty} f(x) = 0 \quad \lim_{x \rightarrow \infty} f(x) = 2$$

$$\lim_{x \rightarrow 3^+} f(x) = \infty \quad \lim_{x \rightarrow 3^-} f(x) = -\infty$$

$$f(-1) = -1 \quad f(0) = 0 \quad f(1) = -1$$

$$\lim_{x \rightarrow 1} f(x) = 1 \quad f(3) = \text{DNE}$$

$$f(2) = 0$$

