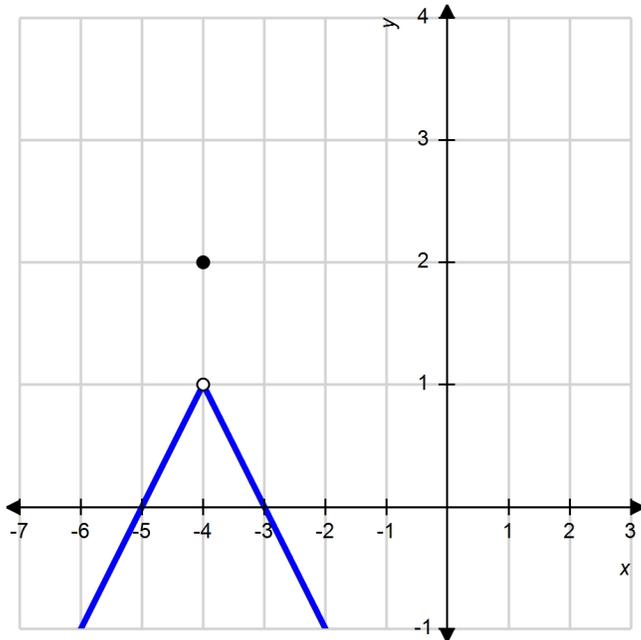


Assessment 1

Indicate the answer choice that best completes the statement or answers the question.

___ 1. Use the graph as shown to determine the following limits, and discuss the continuity of the function at $x = -4$.

(i) $\lim_{x \rightarrow -4^+} f(x)$ (ii) $\lim_{x \rightarrow -4^-} f(x)$ (iii) $\lim_{x \rightarrow -4} f(x)$



- a. 2, 2, 2, continuous
- b. 1, 1, 2, not continuous
- c. 2, 2, 2, not continuous
- d. -4, -4, -4, continuous
- e. 1, 1, 2, continuous

___ 2. Find the x -values (if any) at which $f(x) = \frac{|x + 4|}{x + 4}$ is not continuous.

- a. $f(x)$ is not continuous at $x = -4$ and the discontinuity is nonremovable.
- b. $f(x)$ is not continuous at $x = 0$ and the discontinuity is removable.
- c. $f(x)$ is continuous for all real x .
- d. $f(x)$ is not continuous at $x = -4$ and the discontinuity is removable.
- e. $f(x)$ is not continuous at $x = 0, 4$ and $x = 0$ is a removable discontinuity.

Assessment 1

___ 3. Find all vertical asymptotes (if any) of the function $f(x) = \frac{x^2 + 9x + 20}{x^3 - 2x^2 - 19x + 20}$.

- a. $x = 5, 1$
- b. $x = 5, 1, -4$
- c. $x = -5, -1$
- d. $x = 1$
- e. $x = -1$

___ 4. For the function $f(x) = \frac{-7x}{\sqrt{36x^2 + 6}}$, use a graphing utility to complete the table and estimate the limit as x approaches infinity.

x	10^0	10^1	10^2	10^3	10^4	10^5	10^6
$f(x)$							

- a. -1.1667
- b. 0.0833
- c. 1.2633
- d. -1.8167
- e. does not exist

___ 5. Find all the vertical asymptotes (if any) of the graph of the function $f(x) = \frac{4+x}{x^3(2-x)}$.

- a. $x = -4$
- b. $x = 2$
- c. $x = 0$
- d. $x = 2, x = 0$
- e. no vertical asymptotes

Assessment 1

___ 6. Find the x -values (if any) at which the function $f(x) = -12x^2 + 4x + 4$ is not continuous. Which of the discontinuities are removable?

a. $x = -7$, removable

b. $x = 0$, removable

c. $x = \frac{1}{6}$, not removable

d. continuous everywhere

e. $x = \frac{1}{6}$, not removable

___ 7. Find the limit (if it exists).

$$\lim_{x \rightarrow 2} \frac{\sqrt{x+7} - 3}{x - 2}$$

a. 6

b. 1

c. 0

d. $\frac{1}{6}$

e. Limit does not exist

___ 8. Suppose that $\lim_{x \rightarrow c} f(x) = 8$ and $\lim_{x \rightarrow c} g(x) = -13$. Find the following limit.

$$\lim_{x \rightarrow c} [f(x) + g(x)]$$

a. 0

b. -13

c. 21

d. -5

e. -104

Assessment 1

___ 9. Find the value of c guaranteed by the Intermediate Value Theorem.

$$f(x) = \frac{x^2 + 5x}{x - 2}, \left[\frac{9}{2}, 18 \right], f(c) = 18$$

- a. 11
- b. 4
- c. 3
- d. 9
- e. 10

___ 10. Complete the table and use the result to estimate the limit.

$$\lim_{x \rightarrow 0} \frac{\cos(x) - 1}{x}$$

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

- a. -1
- b. -0.5
- c. 0
- d. 0.5
- e. 1

___ 11. Find the limit.

$$\lim_{x \rightarrow \infty} \frac{6x - 4}{4x + 7}$$

- a. 1
- b. 0
- c. $-\frac{4}{7}$
- d. $\frac{3}{2}$
- e. does not exist

Assessment 1

___ 12. Find the vertical asymptotes (if any) of the function $f(x) = \frac{x^2 - 4}{x^2 + 6x + 8}$.

- a. $x = 2$
- b. $x = -4$
- c. $x = 4$
- d. $x = -8$
- e. $x = -2$

___ 13. Suppose that $\lim_{x \rightarrow c} f(x) = -13$ and $\lim_{x \rightarrow c} g(x) = -15$. Find the following limit.

$$\lim_{x \rightarrow c} [f(x) - g(x)]$$

- a. -13
- b. 2
- c. 195
- d. -28
- e. 0

___ 14. Determine the limit (if it exists).

$$\lim_{x \rightarrow 0} \frac{\sin x (1 - \cos x)}{2x^6}$$

- a. 6
- b. 1
- c. 0
- d. 2
- e. does not exist

___ 15. Find all the vertical asymptotes (if any) of the graph of the function $f(x) = \frac{x^3 + 27}{x + 3}$.

- a. $x = -3$
- b. $x = 27$
- c. $x = 3$
- d. $x = 3, -3$
- e. no vertical asymptotes

Assessment 1

___ 16. Find the limit L .

$$\lim_{x \rightarrow 5} (x + 2)$$

- a. $L = 7$
- b. $L = 2$
- c. $L = 5$
- d. $L = 12$
- e. none of the above

___ 17. A sphere has a volume of 5.24 cubic inches. What is the radius of the sphere? Round your answer to four decimal places.

- a. 1.0775 inches
- b. 1.7104 inches
- c. 1.1185 inches
- d. 2.2369 inches
- e. 2.0287 inches

___ 18. Let $f(x) = -4x - 2$ and $g(x) = x^3$. Find the limit.

$$\lim_{x \rightarrow -3} g(f(x))$$

- a. 100
- b. -27
- c. 106
- d. 1,000
- e. -8

___ 19. Find the value of c guaranteed by the Intermediate Value Theorem.

$$f(x) = x^2 - 4x + 7, [4, 8], f(c) = 12$$

- a. 0
- b. 5
- c. 7
- d. 1
- e. 6

Assessment 1

___ 20. Suppose that $\lim_{x \rightarrow c} f(x) = -4$. Find the following limit.

$$\lim_{x \rightarrow c} [f(x)^3]$$

- a. -7
- b. -64
- c. -1
- d. 0
- e. -12

___ 21. Find the limit.

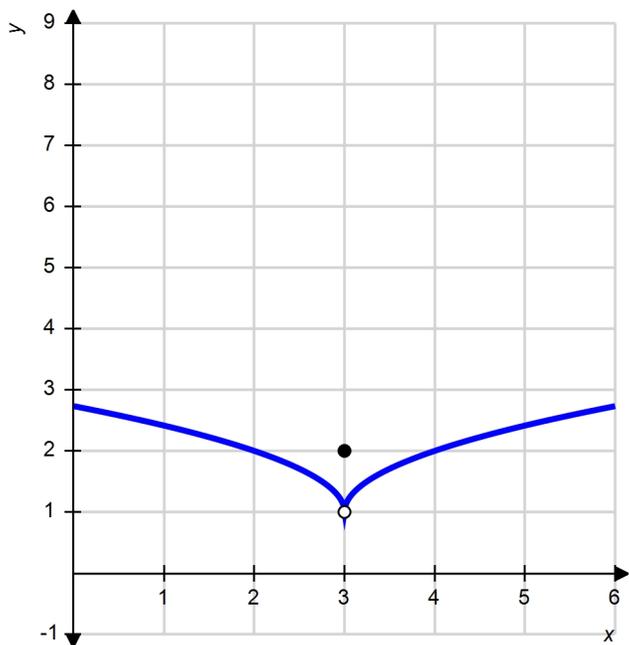
$$\lim_{x \rightarrow \infty} \frac{-4x+2}{7x^2+4}$$

- a. 1
- b. 0
- c. $\frac{1}{2}$
- d. $-\frac{4}{7}$
- e. ∞

Assessment 1

___ 22. Use the graph as shown to determine the following limits, and discuss the continuity of the function at $x = 3$.

- (i) $\lim_{x \rightarrow 3^+} f(x)$ (ii) $\lim_{x \rightarrow 3^-} f(x)$ (iii) $\lim_{x \rightarrow 3} f(x)$



- a. 1, 1, 2, not continuous
- b. 2, 2, 2, continuous
- c. 4, 4, 4, not continuous
- d. 2, 2, 2, not continuous
- e. 1, 1, 2, continuous

Assessment 1

___ 23. Find the limit.

$$\lim_{x \rightarrow 1} \cos\left(\frac{\pi x}{6}\right)$$

a. $\frac{1}{2}$

b. 0

c. $-\frac{1}{2}$

d. $\frac{\sqrt{3}}{2}$

e. $-\frac{\sqrt{3}}{2}$

___ 24. Suppose that $\lim_{x \rightarrow c} f(x) = -2$. Find the following limit.

$$\lim_{x \rightarrow c} (-10f(x))$$

a. -2

b. -20

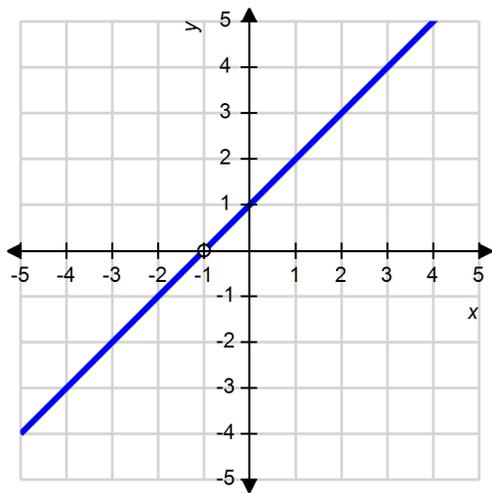
c. 20

d. $-10c$

e. -10

Assessment 1

___ 25. Discuss the continuity of the function $f(x) = \frac{x^2 - 1}{x - 1}$.



- a. $f(x)$ is discontinuous at $x = -1$.
- b. $f(x)$ is discontinuous at $x = -1, 1$.
- c. $f(x)$ is discontinuous at $x = 1$.
- d. $f(x)$ is continuous for all real x .
- e. $f(x)$ is continuous at $x = 2$.