

■ 1. Find the left-hand limit $\lim_{x \rightarrow 2^-} \frac{|x - 2|}{x - 2}$.

A -1

B 1

C -2

D 2

■ 2. If $f(x) = \begin{cases} \ln x & 0 < x \leq 2 \\ x^2 \ln 2 & 2 < x \leq 4 \end{cases}$, then $\lim_{x \rightarrow 2^+} f(x)$ is

A $\ln 2$

B $\ln 8$

C $\ln 16$

D 4

■ 3. Evaluate the limit $\lim_{x \rightarrow 3} \frac{x^2 - 7x + 12}{x^2 - 9}$.

A $\frac{1}{3}$

B $-\frac{1}{3}$

C $\frac{1}{6}$

D $-\frac{1}{6}$

■ 4. Evaluate the limit $\lim_{x \rightarrow 9} \frac{x - 9}{\sqrt{x} - 3}$.

A 6

B 3

C 9

D 0

■ 5. $\lim_{x \rightarrow \infty} \frac{(2x - 1)(3 - x)}{(x - 1)(x + 3)}$

A -3

B -2

C 2

D 3

■ 6. For $x \geq 0$, the horizontal line $y = 2$ is an asymptote for the graph of the function f . Which of the following statements is true?

A $f(0) = 2$

B $f(x) \neq 2$ for all $x \geq 0$

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

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

■ 7. Given $\lim_{x \rightarrow 3^-} f(x) = \infty$, which of the following statements must be true?

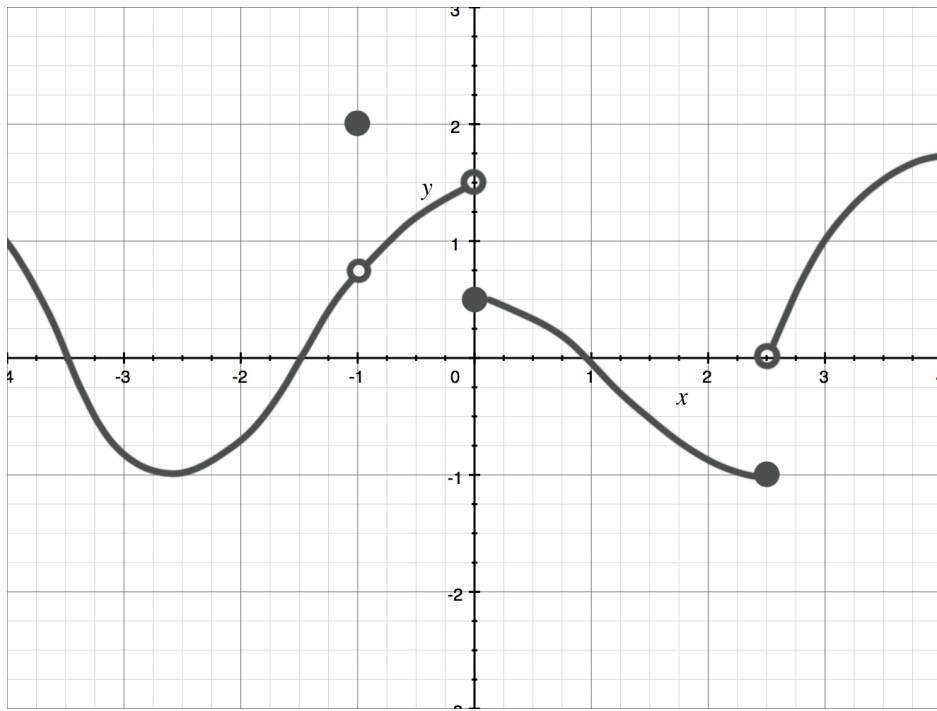
A $\lim_{x \rightarrow 3^+} f(x) = \infty$

B $f(3)$ is undefined

C $f(x)$ has a vertical asymptote when $x = -3$

D $f(x)$ has a vertical asymptote when $x = 3$

■ 8. Use the graph to find the function's limit as $x \rightarrow 0^-$ and $x \rightarrow 0^+$.



A $\lim_{x \rightarrow 0^-} f(x) = -\frac{1}{2}$

$\lim_{x \rightarrow 0^+} f(x) = -\frac{3}{2}$

B $\lim_{x \rightarrow 0^-} f(x) = -\frac{3}{2}$

$\lim_{x \rightarrow 0^+} f(x) = -\frac{1}{2}$

C $\lim_{x \rightarrow 0^-} f(x) = \frac{1}{2}$

$\lim_{x \rightarrow 0^+} f(x) = \frac{3}{2}$

D $\lim_{x \rightarrow 0^-} f(x) = \frac{3}{2}$

$\lim_{x \rightarrow 0^+} f(x) = \frac{1}{2}$

9. Which of the following statements is true?

I. $\lim_{x \rightarrow \infty} \frac{2^x}{x^{22}} = 0$

II. $\lim_{x \rightarrow \infty} \frac{2^x}{\ln x} = 0$

III. $\lim_{x \rightarrow \infty} \frac{\ln x}{x^2} = 0$

A III only

B I and II

C I only

D None are true

■ 10. Given that $f(x) = -x^2$, $g(x) = x^2$, and that $f(x) \leq h(x) \leq g(x)$ for all values of x , which of the following statements is true?

A $\lim_{x \rightarrow \infty} h(x) = 0$

B $\lim_{x \rightarrow 0} h(x) = 0$

C $\lim_{x \rightarrow \infty} h(x) = \infty$

D $\lim_{x \rightarrow 0} h(x) = -1$

■ 11. Which of the following statements would not guarantee that $f(x)$ is continuous at $x = 3$?

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

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

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

D $f(x)$ is a polynomial

■ 12. Given the table below showing select values of a continuous function. Which of the following statements must be true?

x	1	3	7	9	10
f(x)	-3	2	4	-2	2

I. $f(x) > 0$ on the interval $(3,7)$

II. $f(x) = 0$ for at least one x value on the interval $(7,9)$

III. $f(x)$ has exactly 3 zeros on the interval $(1,10)$

A II only

B II and III

C None are true

D All are true

■ 13. Determine the value of c that makes $f(x) = \begin{cases} x + 3 & x \leq -1 \\ 2x - c & x > -1 \end{cases}$ continuous for all real numbers.

■ 14. Draw a diagram of a function on the given set of axes that meets all of the requirements below.

a. $\lim_{x \rightarrow a^-} = 2$

c. $f(a) = -2$

e. $\lim_{x \rightarrow b} = -2$

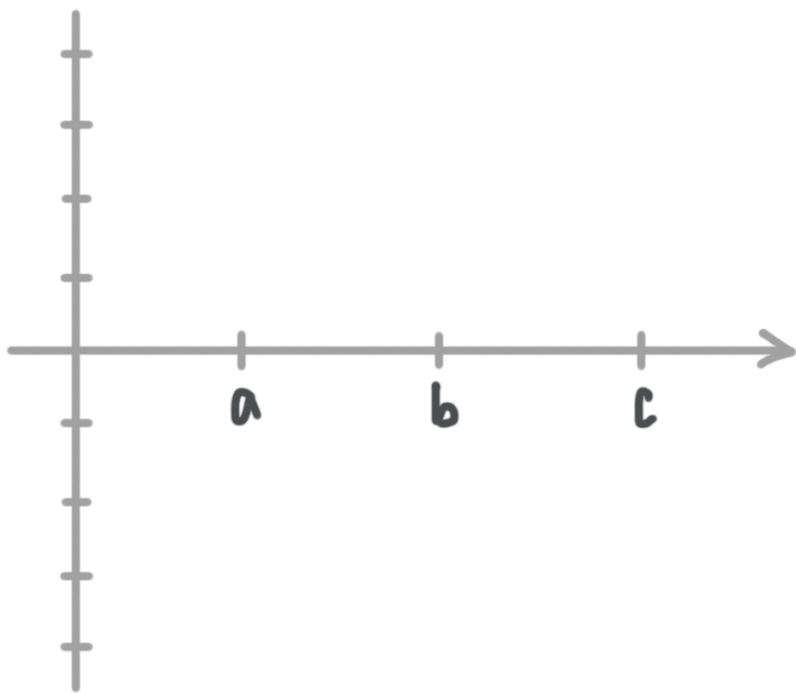
g. $\lim_{x \rightarrow c^+} = \infty$

b. $\lim_{x \rightarrow a^+} = -2$

d. $f(b) = \text{DNE}$

f. $\lim_{x \rightarrow c^-} = \infty$

h. $\lim_{x \rightarrow \infty} = 0$



■ 15. $\lim_{x \rightarrow 2} \frac{x^3 - 4x^2 - 4x + 16}{x - 2}$

■ 16. $\lim_{x \rightarrow 0} \frac{2 - \sqrt{x + 4}}{x}$

■ 17. $\lim_{x \rightarrow 0} \frac{\frac{4}{x+3} - \frac{4}{3}}{x}$