

Limits of Functions - Intro

1 Use the table to find the value $f(x)$ approaches as x gets closer to -1 .

x	-1.1	-1.01	-1.001	-1	-0.999	-0.99	-0.9
f(x)	-0.8	-0.98	-0.998	undefined	-1.002	-1.02	-1.2

A

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

B

$$\lim_{x \rightarrow -1} f(x) = -2$$

C

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

D

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

2 Use the table to evaluate $\lim_{x \rightarrow -1} f(x)$.

x	-1.1	-1.01	-1.001	-1	-0.999	-0.99	-0.9
f(x)	3.1	3.01	3.001	undefined	2.999	2.99	2.9

A

$$\lim_{x \rightarrow -1} f(x) = 4$$

B

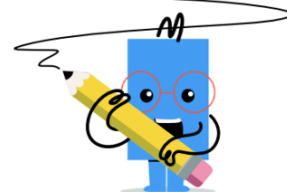
$$\lim_{x \rightarrow -1} f(x) = 5$$

C

$$\lim_{x \rightarrow -1} f(x) = 2$$

D

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



Limits of Functions - Intro

3 Use the table to find the value $f(x)$ approaches as x gets closer to 0.

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
f(x)	0.9	0.99	0.999	-2	1.001	1.01	1.1

A

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

B

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

C

$$\lim_{x \rightarrow 0} f(x) = 3$$

D

$$\lim_{x \rightarrow 0} f(x) = 1$$

4 Use the table to evaluate $\lim_{x \rightarrow -2} f(x)$.

x	-2.1	-2.01	-2.001	-2	-1.999	-1.99	-1.9
f(x)	0.1	0.01	0.001	1	-0.001	-0.01	-0.1

A

$$\lim_{x \rightarrow -2} f(x) = -1$$

B

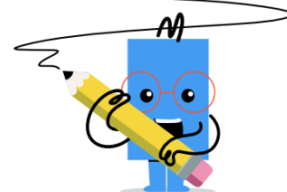
$$\lim_{x \rightarrow -2} f(x) = 0$$

C

$$\lim_{x \rightarrow -2} f(x) = 1$$

D

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



Limits of Functions - Intro

5 Use the table to find the value $f(x)$ approaches as x approaches -1 , and the value of $f(-1)$.

x	-1.1	-1.01	-1.001	-1	-0.999	-0.99	-0.9
f(x)	-0.1	-0.01	-0.001	-2	0.001	0.01	0.1

A

$$\lim_{x \rightarrow -1} f(x) = 0, f(-1) = 0$$

B

$$\lim_{x \rightarrow -1} f(x) = -2, f(-1) = -2$$

C

$$\lim_{x \rightarrow -1} f(x) = 0, f(-1) = -2$$

D

$$\lim_{x \rightarrow -1} f(x) = -2, f(-1) = 0$$

6 Use the table to find $\lim_{x \rightarrow -2} f(x)$ and the value $f(-2)$.

x	-2.1	-2.01	-2.001	-2	-1.999	-1.99	-1.9
f(x)	-2.9	-2.99	-2.999	-4	-3.001	-3.01	-3.1

A

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

B

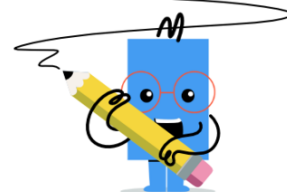
$$\lim_{x \rightarrow -2} f(x) = -3, f(-2) = -4$$

C

$$\lim_{x \rightarrow -2} f(x) = -4, f(-2) = -3$$

D

$$\lim_{x \rightarrow -2} f(x) = -3, f(-2) = -3$$



Limits of Functions - Intro

7 Use the table to find the value $f(x)$ approaches as x approaches 2 from the right.

x	1.9	1.99	1.999	2	2.001	2.01	2.1
f(x)	-3.1	-3.01	-3.001	-3	-3.002	-3.02	-3.2

A

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

B

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

C

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

D

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

8 Use the table to evaluate the one-sided limit as x approaches 0 from the left.

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
f(x)	3.1	3.01	3.001	3	3.001	3.01	3.1

A

$$\lim_{x \rightarrow 0^-} f(x) = 4$$

B

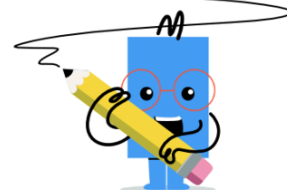
$$\lim_{x \rightarrow 0^-} f(x) = 2$$

C

$$\lim_{x \rightarrow 0^-} f(x) = 5$$

D

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



Limits of Functions - Intro

9 Use the table to find the value $f(x)$ approaches as x approaches 0 from both sides.

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
f(x)	-1.8	-1.98	-1.998	-2	-2.001	-2.01	-2.1

A

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

B

$$\lim_{x \rightarrow 0} f(x) = -3$$

C

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

D

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

10 Use the table to evaluate $\lim_{x \rightarrow 0} f(x)$ (the two-sided limit).

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
f(x)	1.9	1.99	1.999	2	1.998	1.98	1.8

A

$$\lim_{x \rightarrow 0} f(x) = 4$$

B

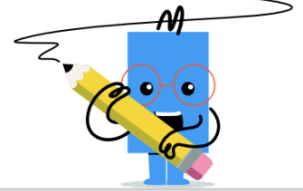
$$\lim_{x \rightarrow 0} f(x) = 3$$

C

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

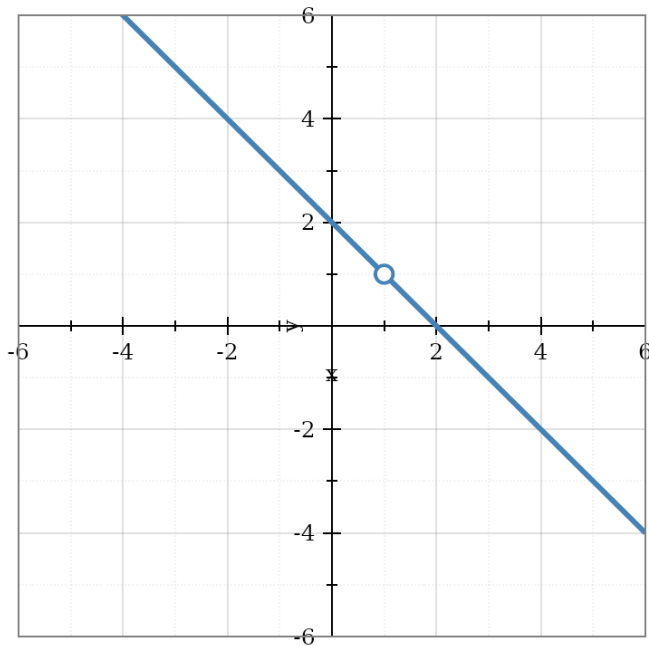
D

$$\lim_{x \rightarrow 0} f(x) = 1$$



Limits of Functions - Intro

11 Use the graph to find the value $f(x)$ approaches as x gets closer to 1.



A

$$\lim_{x \rightarrow 1} f(x) = 0$$

B

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

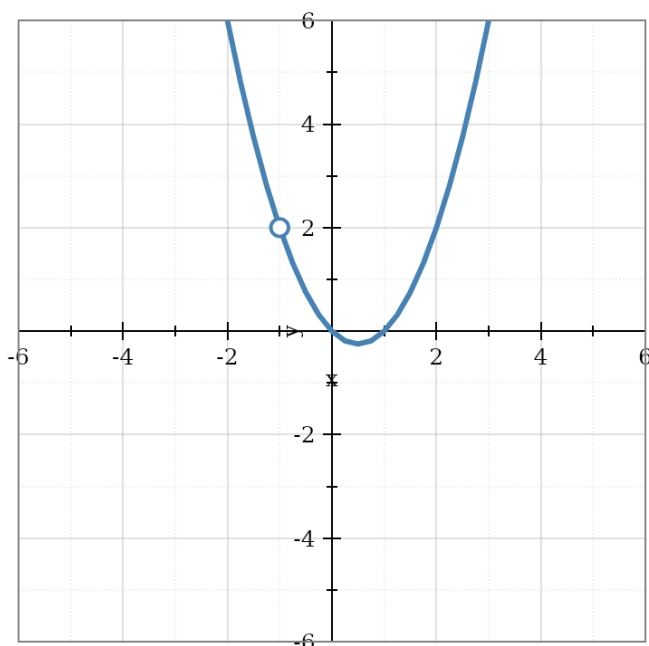
C

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

D

$$\lim_{x \rightarrow 1} f(x) = 2$$

12 Use the graph to evaluate $\lim_{x \rightarrow -1} f(x)$.



A

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

B

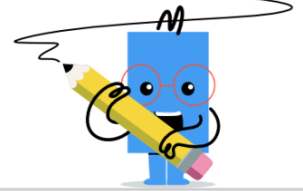
$$\lim_{x \rightarrow -1} f(x) = 4$$

C

$$\lim_{x \rightarrow -1} f(x) = 2$$

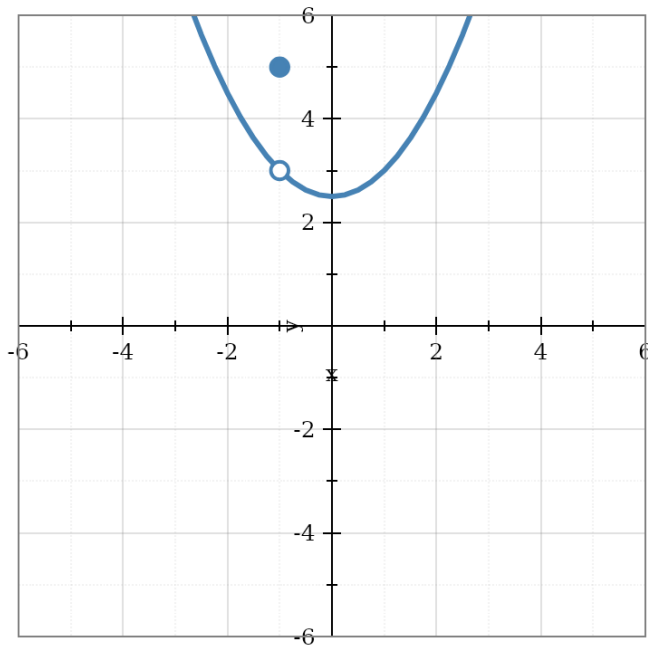
D

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



Limits of Functions - Intro

13 Use the graph to find the value $f(x)$ approaches as x gets closer to -1 .



A

$$\lim_{x \rightarrow -1} f(x) = 2$$

B

$$\lim_{x \rightarrow -1} f(x) = 5$$

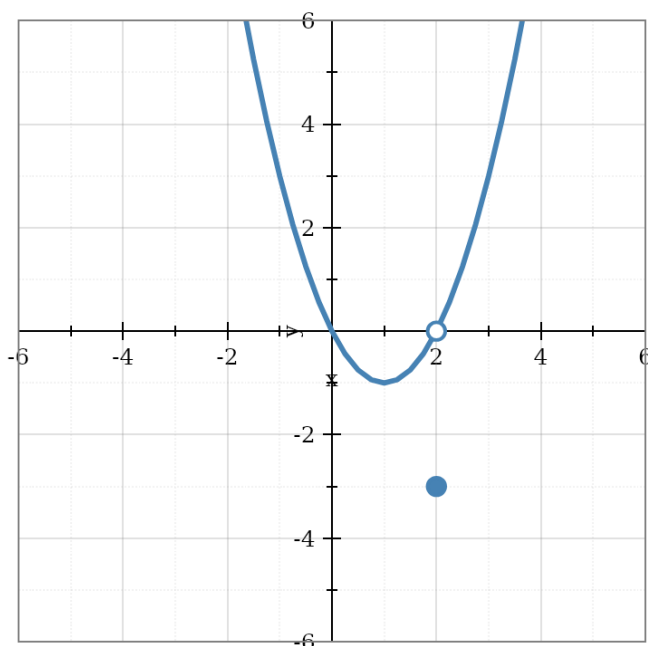
C

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

D

$$\lim_{x \rightarrow -1} f(x) = 4$$

14 Use the graph to evaluate $\lim_{x \rightarrow 2} f(x)$.



A

$$\lim_{x \rightarrow 2} f(x) = 1$$

B

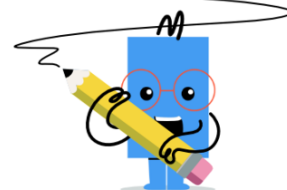
$$\lim_{x \rightarrow 2} f(x) = -1$$

C

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

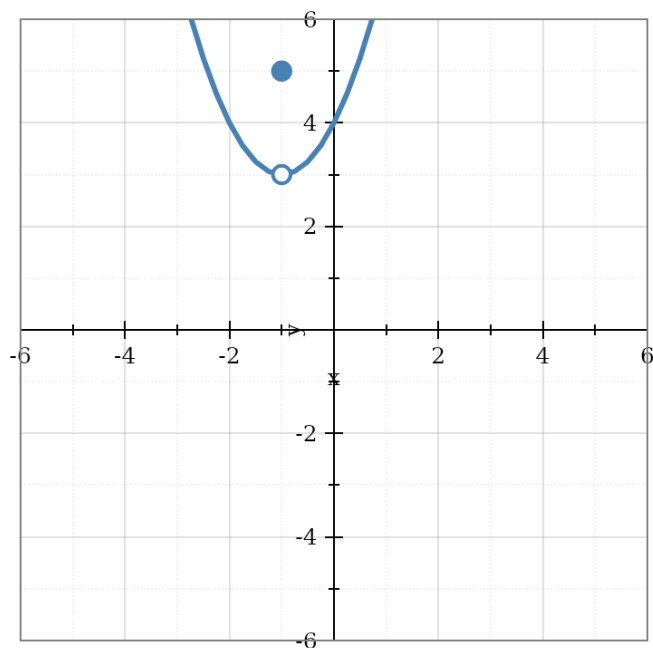
D

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



Limits of Functions - Intro

15 Use the graph to find the value $f(x)$ approaches as x approaches -1 , and the value of $f(-1)$.



A

$$\lim_{x \rightarrow -1} f(x) = 5, f(-1) = 5$$

B

$$\lim_{x \rightarrow -1} f(x) = 5, f(-1) = 3$$

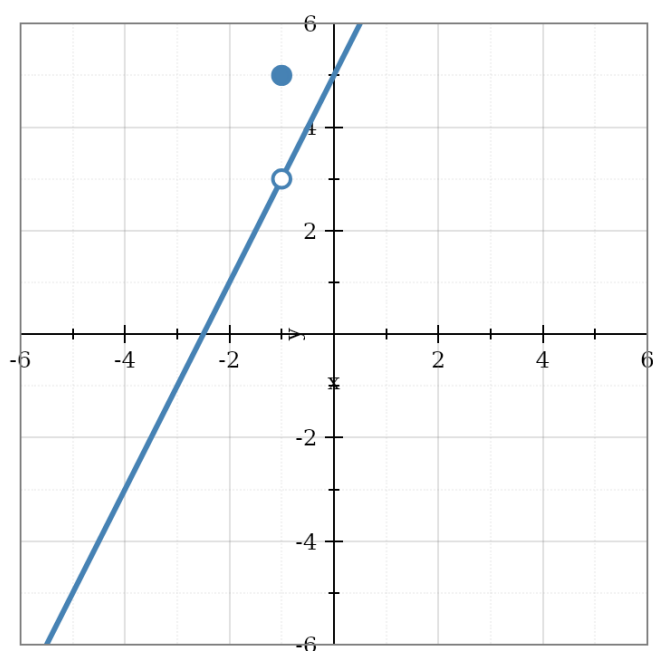
C

$$\lim_{x \rightarrow -1} f(x) = 3, f(-1) = 5$$

D

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

16 Use the graph to find $\lim_{x \rightarrow -1} f(x)$ and the value $f(-1)$.



A

$$\lim_{x \rightarrow -1} f(x) = 3, f(-1) = 5$$

B

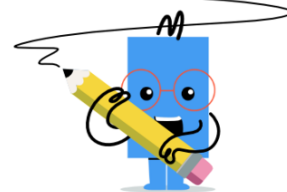
$$\lim_{x \rightarrow -1} f(x) = 3, f(-1) = 3$$

C

$$\lim_{x \rightarrow -1} f(x) = 5, f(-1) = 3$$

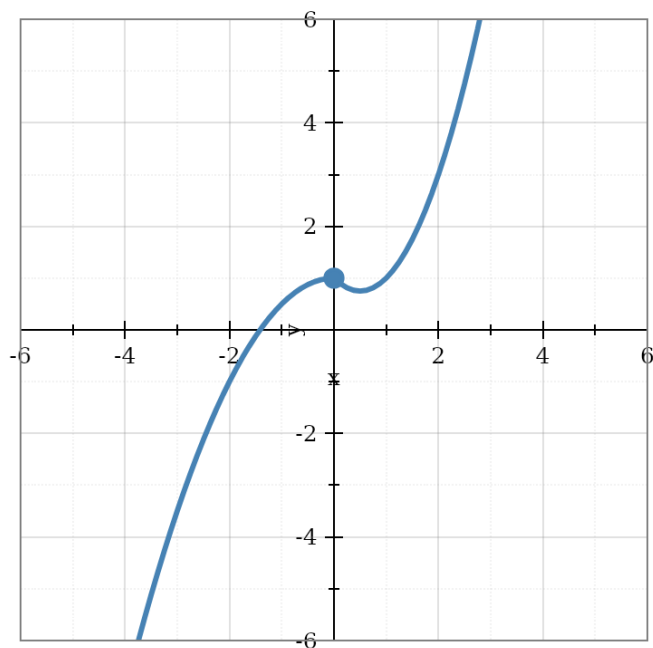
D

$$\lim_{x \rightarrow -1} f(x) = 5, f(-1) = 5$$



Limits of Functions - Intro

17 Use the graph to find the value $f(x)$ approaches as x approaches 0 from the right.



A

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

B

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

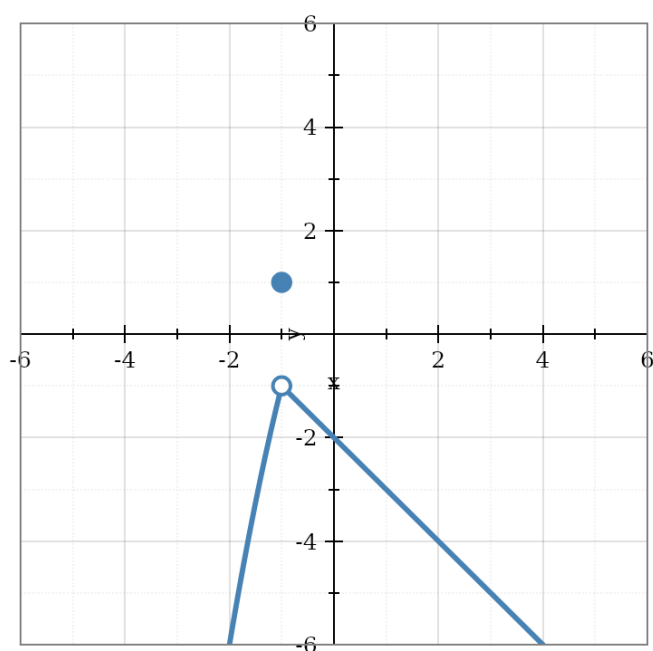
C

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

D

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

18 Use the graph to evaluate the one-sided limit as x approaches -1 from the left.



A

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

B

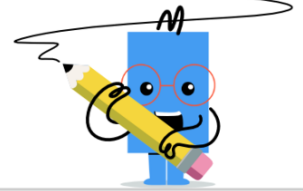
$$\lim_{x \rightarrow -1^-} f(x) = -2$$

C

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

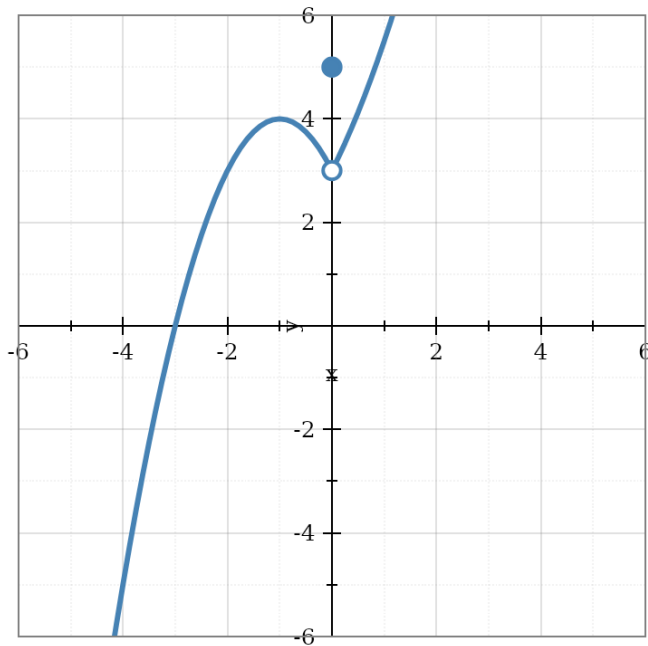
D

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



Limits of Functions - Intro

19 Use the graph to find the value $f(x)$ approaches as x approaches 0 from both sides.



A

$$\lim_{x \rightarrow 0} f(x) = 4$$

B

$$\lim_{x \rightarrow 0} f(x) = 5$$

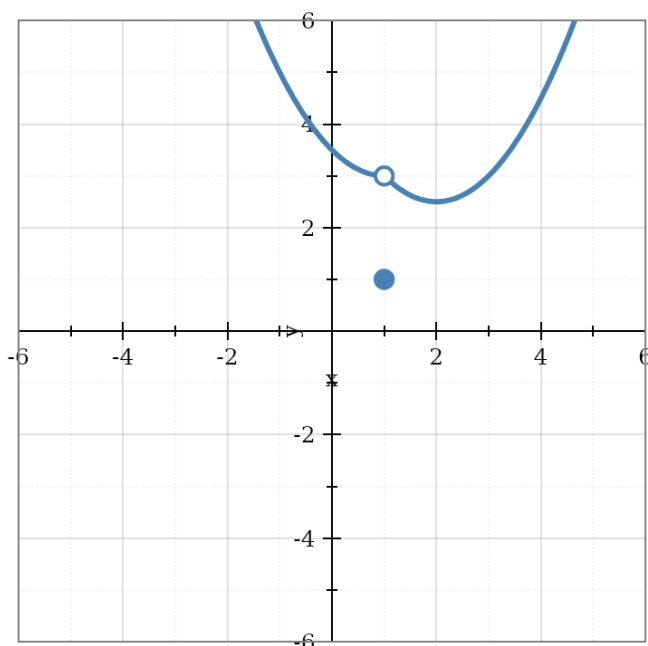
C

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

D

$$\lim_{x \rightarrow 0} f(x) = 3$$

20 Use the graph to evaluate $\lim_{x \rightarrow 1} f(x)$ (the two-sided limit).



A

$$\lim_{x \rightarrow 1} f(x) = 4$$

B

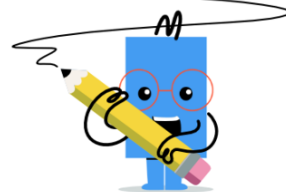
$$\lim_{x \rightarrow 1} f(x) = 5$$

C

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

D

$$\lim_{x \rightarrow 1} f(x) = 2$$



Limits of Functions - Intro

21 Evaluate the limit.

$$\lim_{x \rightarrow 3} (2x^2 - 2x - 4)$$

A	10	B	9
C	7	D	8

22 Evaluate the limit.

$$\lim_{x \rightarrow -2} \frac{-2x}{-3x - 4}$$

A	$\frac{1}{2}$	B	2
C	$\frac{5}{2}$	D	-2

23 For which value of x is this function indeterminate (0/0)?

$$f(x) = \frac{x^2 - 1}{x - 1}$$

A	$x = 3$	B	$x = 1$
C	$x = 2$	D	$x = 0$

24 Factor and cancel, then evaluate the limit.

$$\lim_{x \rightarrow 3} \frac{x^2 - 2x - 3}{x - 3}$$

A	4	B	6
C	5	D	3

25 Multiply by the conjugate, cancel, then evaluate the limit.

$$\lim_{x \rightarrow 2} \frac{\sqrt{x-1} - 1}{x-2}$$

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

26 Multiply by the conjugate, manipulate and cancel, then evaluate the limit.

$$\lim_{x \rightarrow 3} \frac{x-3}{\sqrt{x+13}-4}$$

A	8	B	9
C	7	D	10

27 Does the two-sided limit of this function exist at $x = -1$?

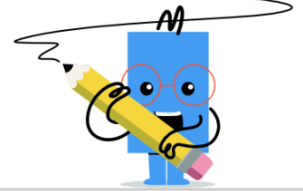
$$f(x) = \begin{cases} 2x+1, & x < -1 \\ -2, & x = -1 \\ -x-2, & x > -1 \end{cases}$$

A	Yes	B	No
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28 Is this function continuous at $x = 2$?

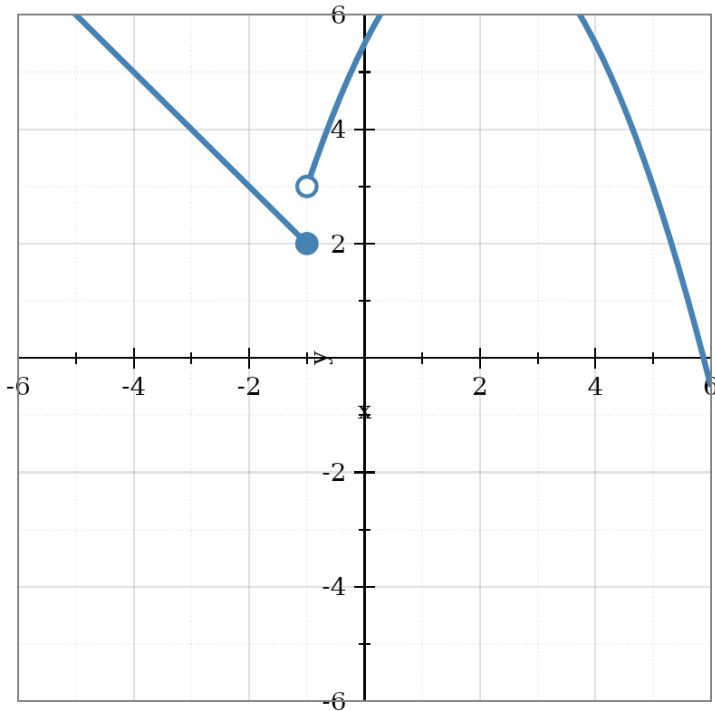
$$f(x) = \begin{cases} x-4, & x < 2 \\ 0, & x = 2 \\ -x, & x > 2 \end{cases}$$

A	No	B	Yes
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Limits of Functions - Intro

29 Does the two-sided limit of this function exist at $x = -1$?



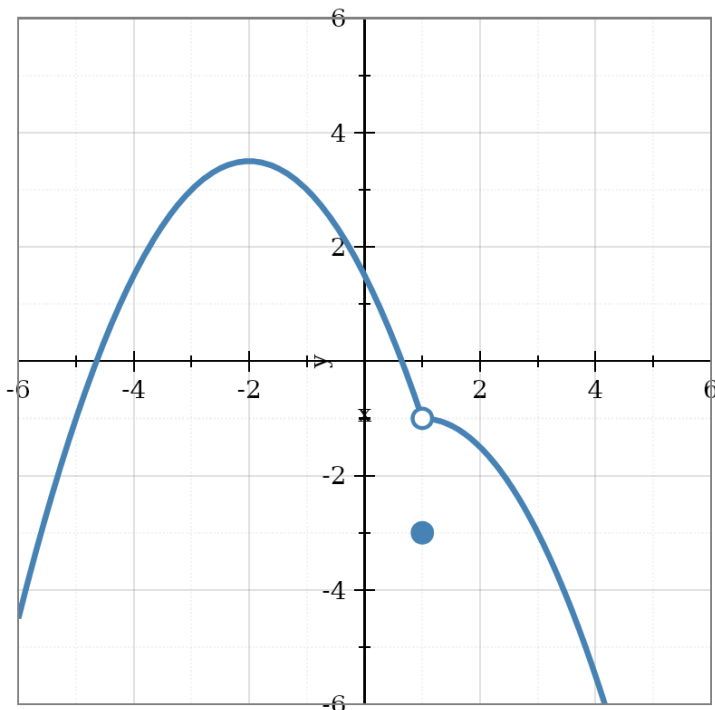
A

Yes

B

No

30 Is this function continuous at $x = 1$?

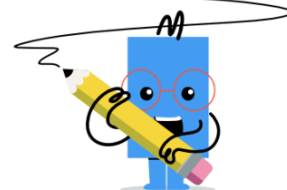


A

Yes

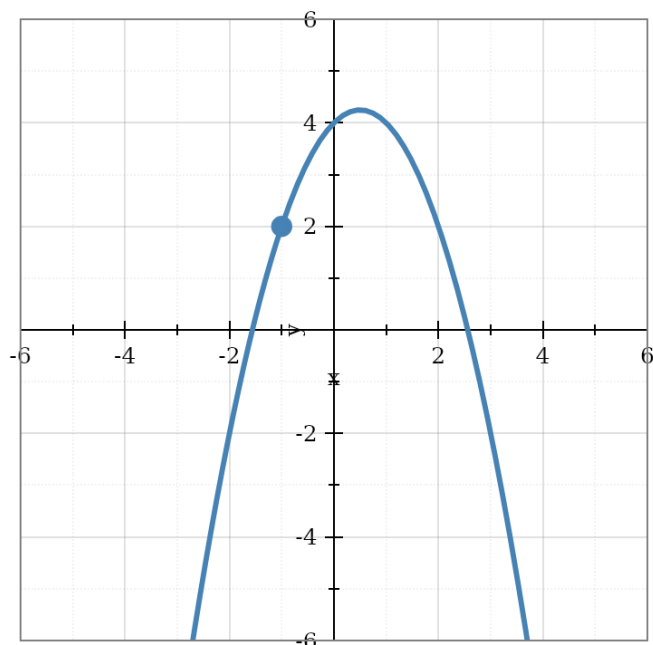
B

No



Limits of Functions - Intro

31 For this piecewise function at $x = -1$: does the limit exist, and is the function continuous?



A

The limit exists but the function is not continuous

B

The limit does not exist and the function is not continuous

C

The limit exists and the function is continuous

32 For this piecewise function at $x = 2$: does the limit exist, and is the function continuous?

$$f(x) = \begin{cases} -2x + 5, & x < 2 \\ -2, & x = 2 \\ 2x - 3, & x > 2 \end{cases}$$

A The limit does not exist and the function is not continuous

B The limit exists but the function is not continuous

C The limit exists and the function is continuous

33 Find the value of k that makes this piecewise function continuous at $x = 1$.

$$f(x) = \begin{cases} -2x + 1, & x \leq 1 \\ 2x + k, & x > 1 \end{cases}$$

A

1

B

-4

C

-3

D

-2

34 Evaluate the limit at infinity.

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

A

-2

B

0

C

 $\frac{1}{2}$

D

2

35 Evaluate the limit at infinity.

$$\lim_{x \rightarrow \infty} \frac{-3x^2 + x + 3}{3x^2 + 3x - 2}$$

A

 ∞

B

-1

C

1

D

0