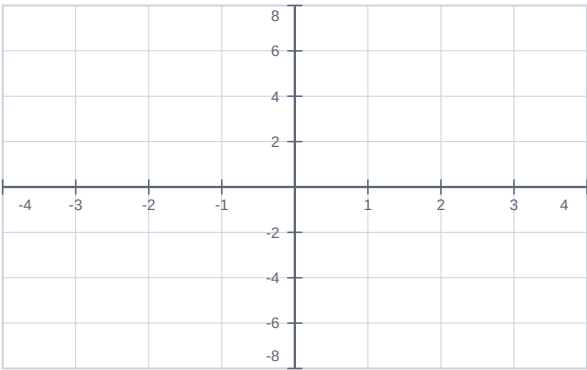


Jump Discontinuity Limits from Graphs

Use the equation or graph to find both one-sided limits and the two-sided limit.

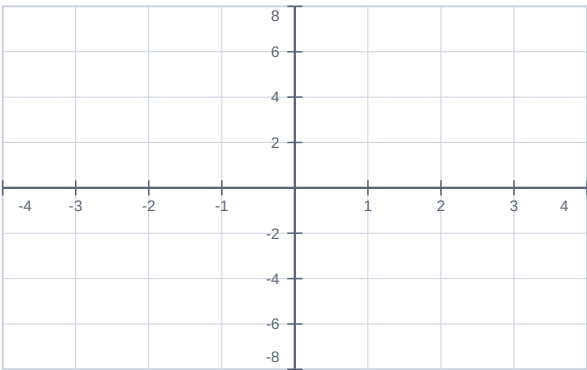
1. $f(x) =$
 $4, x < -1$
 $6, x > -1$

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



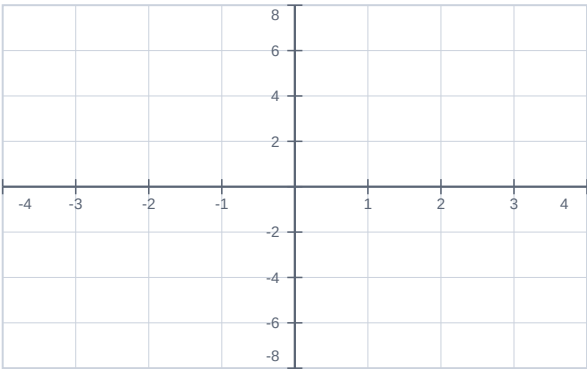
2. $f(x) = -2 - \frac{|x|}{x}$

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



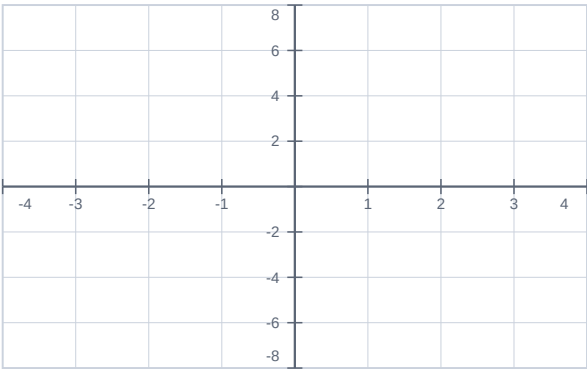
3. $f(x) =$
 $-x + 3, x < 1$
 $-x + 2, x > 1$

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



4. $f(x) = -1 - 2 \frac{|x + 2|}{x + 2}$

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

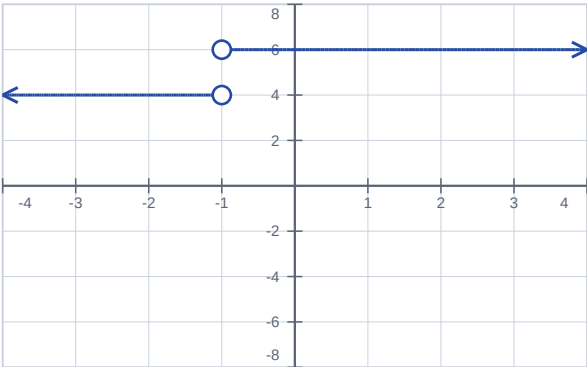


Jump Discontinuity Limits from Graphs
Worked Answer Key

Use the equation or graph to find both one-sided limits and the two-sided limit.

1. $f(x) =$
 $4, x < -1$
 $6, x > -1$

$\lim_{x \rightarrow -1^-} f(x) = 4$
 $\lim_{x \rightarrow -1^+} f(x) = 6$
 $\lim_{x \rightarrow -1} f(x) = \text{DNE}$



Exact substitution into the adjacent polynomial pieces gives unequal one-sided limits. Original domain: $x \neq -1$

Jump Discontinuity Limits from Graphs
Worked Answer Key

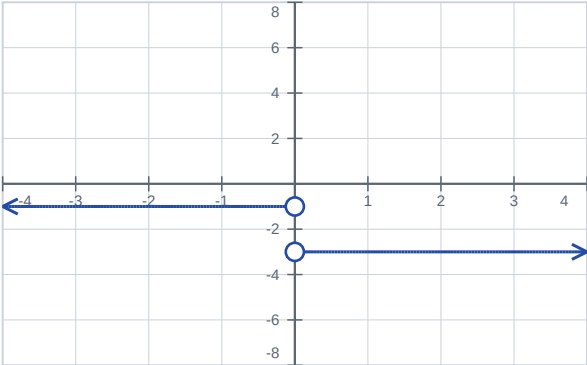
Use the equation or graph to find both one-sided limits and the two-sided limit.

2. $f(x) = -2 - \frac{|x|}{x}$

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

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

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



The sign of x-a changes across the junction, producing two different constants. Original domain: $x \neq 0$

Jump Discontinuity Limits from Graphs
Worked Answer Key

Use the equation or graph to find both one-sided limits and the two-sided limit.

3. $f(x) =$

- $x + 3$, $x < 1$

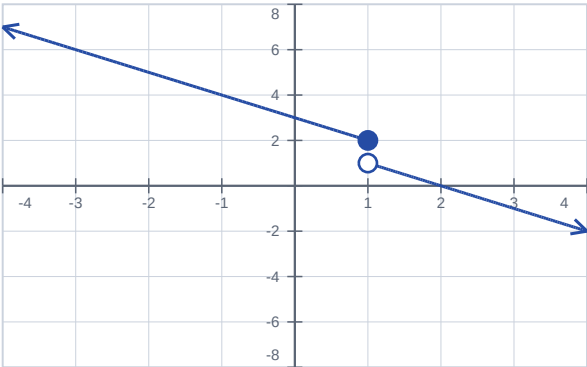
- $x + 2$, $x > 1$

$f(1) = 2$

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

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

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



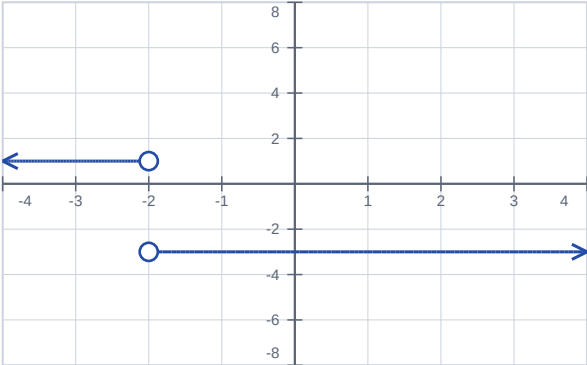
Exact substitution into the adjacent polynomial pieces gives unequal one-sided limits. $f(1) = 2$. Original domain: All real x .

Jump Discontinuity Limits from Graphs
Worked Answer Key

Use the equation or graph to find both one-sided limits and the two-sided limit.

4. $f(x) = -1 - 2 \frac{|x + 2|}{x + 2}$

$\lim_{x \rightarrow -2^-} f(x) = 1$
 $\lim_{x \rightarrow -2^+} f(x) = -3$
 $\lim_{x \rightarrow -2} f(x) = \text{DNE}$



The sign of x-a changes across the junction, producing two different constants. Original domain: $x \neq -2$