

Topic: Idea of the limit

Question: What statement is being made by the limit equation?

$$\lim_{x \rightarrow 3} (x^2 - 1) = 8$$

Answer choices:

- A The limit as x approaches 8 of the function $f(x) = x^2 - 1$ is 3.
- B The limit as x approaches 3 of the function $f(x) = x^2 - 1$ is not 8.
- C The limit as x approaches 8 of the function $f(x) = x^2 - 1$ is not 3.
- D The limit as x approaches 3 of the function $f(x) = x^2 - 1$ is 8.



Solution: D

Break down the limit

$$\lim_{x \rightarrow 3} (x^2 - 1) = 8$$

into its component parts:

- x approaches 3
- the function is $f(x) = x^2 - 1$
- the value of the limit is 8

Putting these pieces together gives a full statement of the limit:

“The limit as x approaches 3 of the function $f(x) = x^2 - 1$ is equal to 8.”



Topic: Idea of the limit

Question: Use limit notation to write the limit of the function $f(x)$ as x approaches 3.

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

Answer choices:

A $\lim_{x \rightarrow -3} f(x) = \frac{x - 6}{x}$

B $\lim_{x \rightarrow 3} f(x) = \frac{x - 6}{x}$

C $\lim_{x \rightarrow 3} \frac{x - 6}{x}$

D $\lim_{x \rightarrow -3} \frac{x - 6}{x}$



Solution: C

When a is the value that x approaches, and $f(x)$ is the given function, the limit is written as

$$\lim_{x \rightarrow a} f(x)$$

In this case, x approaches 3, so $a = 3$, and the function is

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

So we'd write the limit as

$$\lim_{x \rightarrow 3} \frac{x - 6}{x}$$



Topic: Idea of the limit

Question: Evaluate the limit.

$$\lim_{x \rightarrow 3} \frac{x - 6}{x}$$

Answer choices:

A -3

B 3

C -1

D 1



Solution: C

To evaluate the limit,

$$\lim_{x \rightarrow 3} \frac{x - 6}{x}$$

plug the value that's being approached into the function, then simplify the answer.

$$\frac{3 - 6}{3}$$

$$\frac{-3}{3}$$

$$-1$$

