

Extra piecewise limit practice:

$$f(x) = \begin{cases} x^2 + 1, & x \geq -1 \\ -3x - 1, & x < -1 \\ 5, & x = -1 \end{cases}$$

a) \lim

$$x \rightarrow -1^+$$

b) \lim

$$x \rightarrow -1^-$$

c) \lim

$$x \rightarrow -1$$

d) Is this graph continuous at $x = -1$?

Answers

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

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

c) $\lim_{x \rightarrow -1}$ General Limit Left + Right Agree at 2

d) Not Continuous General Limit \neq actual value of 5