



What are examples in your life  
where you refer to limits?

Wed. August 28, 2013

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Students will verbally explain how to  
find the limit analytically and graphically  
(using the words:  
evaluate, simplify, right, left...)

Limit

The y-value that the function approaches as you focus in on an x-value

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

Left-hand limit

The y-value the function approaches as you focus in on an x-value from the left (values less than  $x=a$ )

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

Right-Hand Limit

The y-value the function approaches as you focus in on an x-value from the right (values greater than  $x=a$ )

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

find the limit using substitution

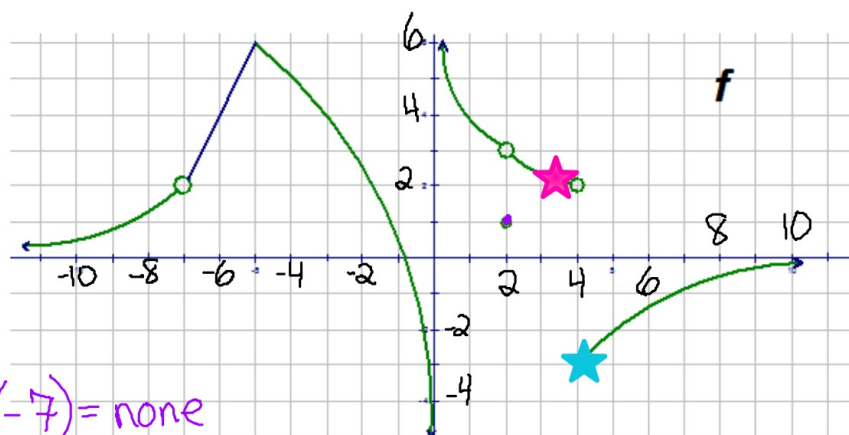
$$\lim_{x \rightarrow 4} x^2 = 4^2 = 16$$

$$\lim_{x \rightarrow 5^-} \sqrt{5-x} = \sqrt{5-5} = \sqrt{0} = 0$$

(approach from the left because  $x > 5$  is not in the domain)

$$\lim_{x \rightarrow 2} \frac{x^2 + 5x + 6}{x + 2} = \frac{2^2 + 5(2) + 6}{2 + 2} = 5$$

$$\lim_{x \rightarrow -4} (x+3)^{1998} = (-4+3)^{1998} = (-1)^{1998} = 1$$



$$f(-7) = \text{none}$$

$$1. f(-5) = 6$$

$$2. f(2) = 1$$

$$4. \lim_{x \rightarrow 7} f(x) = 2$$

$$5. \lim_{x \rightarrow 5} f(x) = 6$$

$$6. \lim_{x \rightarrow 2} f(x) = 3$$

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

$$\lim_{x \rightarrow 4^+} f(x) = -3$$

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

What if

$$\lim_{x \rightarrow a^-} f(x) \neq \lim_{x \rightarrow a^+} f(x)$$

Then

$\lim_{x \rightarrow a} f(x)$  does not exist (DNE)

(or  $\lim_{x \rightarrow a} f(x)$  is undefined)

