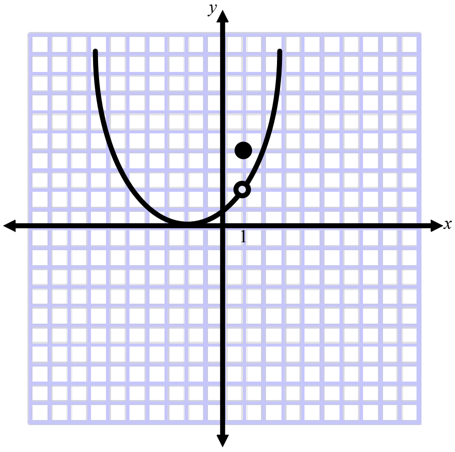
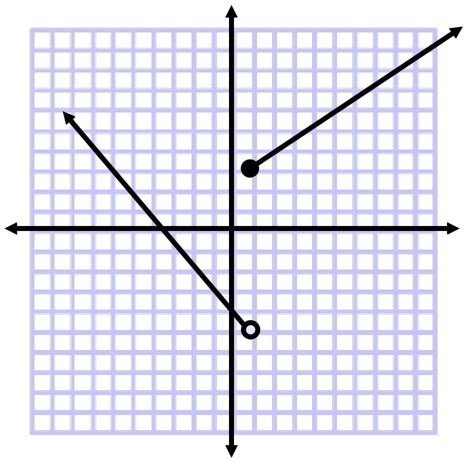
$\lim_{x \to 1} f(x) =$ ______



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



$$\lim_{x\to 1}\frac{\sqrt{2x+1}-\sqrt{3}}{x-1}$$

Given $g(x) = \begin{cases} \sqrt{1-x}, & x \le 1 \\ x+1, & x > 1 \end{cases}$

Find $\lim_{x \to 1^-} f(x) = \_\_\_\_$

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

$\lim_{x \to 1} f(x) = \_\_\_\_$

$$\lim_{\triangle x \to 0} \frac{(x+\triangle x)^2 - x^2 + 3\triangle x}{\triangle x}$$

Position Function: $s(t) = -16t^2 + v_0 t + s_0$ (units ----feet)

$s(t) \to$ *position after a period of time*

$v_0 \to$ *initial velocity*

$+$ *when object moving upward*

$-$ *when object propelled downward*

0 *when object in free fall*

$s_0 \to$ *initial position*

Definition of Velocity: $\lim_{t \to a} \frac{s(a) - s(t)}{a - t}$

Example: **An object falls from a height of 1000 feet above the ground.**

a) Build the position function.____

b) Use the definition of velocity to find the velocity of the object after 2 seconds.

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

Find *a* such that the function will be continuous everywhere

Discuss the continuity of this function using the 3 part definition of continuity at a point.

$$f(x)=\begin{cases} x^3, & x\le 1 \\ 2x-1, & x>1 \end{cases}$$

Find ALL asymptotes of the following equation.

$$y = \frac{3x^2 - 1}{x^2 - 4}$$

Verify the applicability of the IVT for this function on the given interval and find the guaranteed "c" value.

$f(x) = -2x^2 - 1$ **on [0, 3] for** $f(c) = -10$

$$\lim_{x\to 0}\frac{\sin x}{x} = \_\_\_\_\_\_\_\_$$

$$\lim_{x\to 0}\frac{1-\cos x}{x} = \_\_\_\_\_\_$$

Examples:

$$\lim_{x\to 0}\frac{\sin 3x}{x}$$

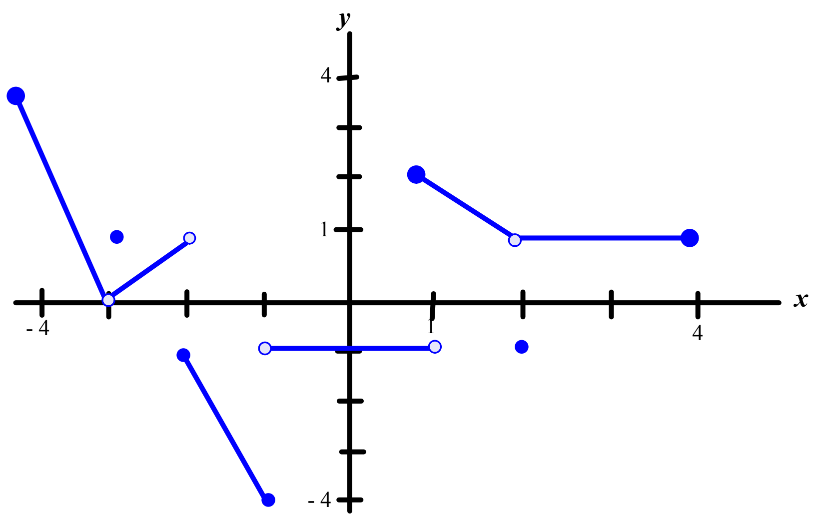
$$\lim_{x\to 0}\frac{1-\cos^2 x}{x}$$

One Sided Limits

$$\lim_{x \to 5^-} \sqrt{x-5} = \_\_\_\_\_$$

$$\lim_{x \to 5^+} \sqrt{x-5} = \_\_\_\_\_$$

$$\lim_{x \to 5} \sqrt{x-5} = \_\_\_\_\_$$



Where is this function defined on the interval [-4, 4] ?

Where do the limits fail to exist on in the interval [-4,4] ?

$$\lim_{x \to 5^+} \frac{|4x - 20|}{5 - x}$$