11.3 More on Limits

Target 9B: Evaluate a limit of a function numerically
Target 9D: Calculate one-sided limits and two-sided limits

Review of Prior Concepts

Graph function $h(x)$ such that it has <u>all</u> of the characteristics below:
$h(-3) = 0$, $h(0) = 4$ and $h(1) = 1$

$h(3) = 1$ and $h(5) = 2$

$\lim\limits_{x \to 0^+} h(x) = 1$

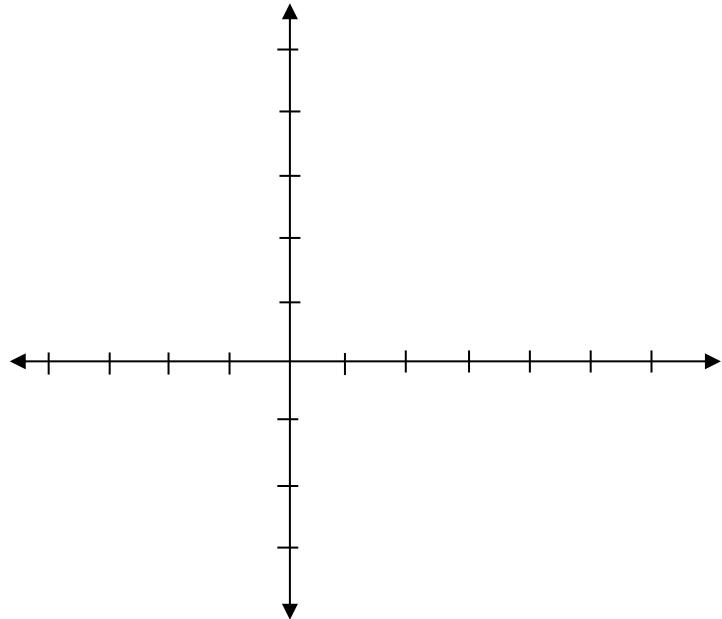$\lim\limits_{x \to 0^-} h(x) = 4$

$\lim\limits_{x \to 3^+} h(x) = 2$

$\lim\limits_{x \to 3^-} h(x) = 1$

$\lim\limits_{x \to -\infty} h(x) = -\infty$

$\lim\limits_{x \to \infty} h(x) = \infty$

More Practice

Limits Graphically
http://www.coolmath.com/precalculus-review-calculus-intro/precalculus-algebra/21-rational-functions-limits-infinity-right-left-01
https://www.khanacademy.org/math/ap-calculus-ab/limits-basics-ab/limits-from-graphs-ab/v/limits-from-graphs-undefined
http://precalculus.flippedmath.com/23-limits-graphically.html
http://philschatz.com/precalculus-book/contents/m49452.html
http://www.mathsisfun.com/calculus/limits.html
https://youtu.be/IklVRSonvFQ
https://youtu.be/UkjgJQaGx98
https://youtu.be/XOu_LFGai0A

Finding Limits Numerically
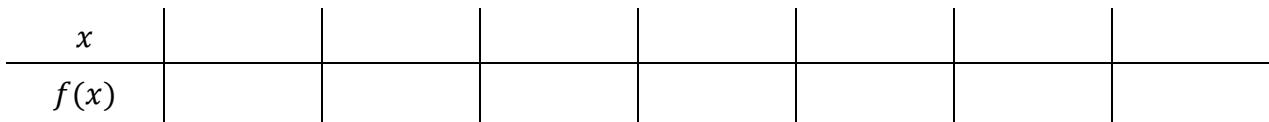
- Use a table of values to find the limit.

Examples:
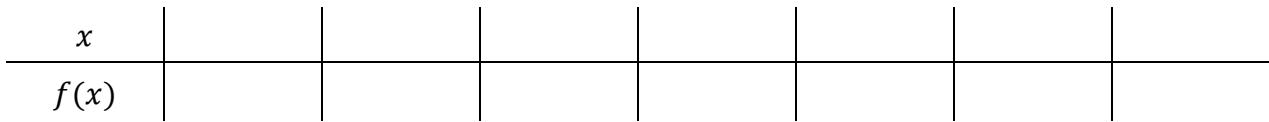
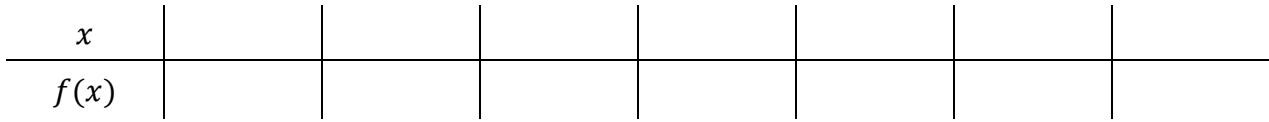**1.** Find $\lim\limits_{x \to 3} \dfrac{x^2 - 9}{x - 3}$

x				3			
$f(x)$							

2. Find $\lim\limits_{x\to 4} \sqrt{x-4}$

x							
$f(x)$							

3. Find $\lim\limits_{x\to -2^+} \dfrac{1}{x+2}$

x							
$f(x)$							

4. Find $\lim\limits_{x\to 5} \dfrac{1}{x^2-25}$

x							
$f(x)$							

Limits of Piecewise Functions

Examples:

1. $f(x) = \begin{cases} 2-x, & \text{if } x < -2 \\ x^2, & \text{if } x \geq -2 \end{cases}$

Find:

a) $\lim\limits_{x\to -2^-} f(x)$ **b)** $\lim\limits_{x\to -2^+} f(x)$ **c)** $\lim\limits_{x\to -2} f(x)$ **d)** $f(-2)$

2. $f(x) = \begin{cases} x - 4, & \text{if } x < 3 \\ 5, & \text{if } x = 3 \\ 8 - x^2, & \text{if } x > 3 \end{cases}$

Find:
    a) $\lim\limits_{x \to 3^-} f(x)$ **b)** $\lim\limits_{x \to 3^+} f(x)$ **c)** $\lim\limits_{x \to 3} f(x)$ **d)** $f(3)$

Homework Assignment
Limits Numerically Worksheet