Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ICM Notes – 5.6 Finding Limits Graphically & Numerically**

$$\lim\_{x\to c}f\left(x\right)=L$$

means

Note:

Examples: Evaluate each using the graphs.

1. A) $\lim\_{x\to 1}f\left(x\right)$ B) $\lim\_{x\to -1}f\left(x\right)$ 2. A) $\lim\_{x\to 2}f\left(x\right)$ B) $f(2)$





One-sided Limits

$\lim\_{x\to c^{-}}f\left(x\right)$

$\lim\_{x\to c^{+}}f\left(x\right)$

Example

3. A) $\lim\_{x\to 0^{-}}f\left(x\right)$ B) $\lim\_{x\to 0^{+}}f\left(x\right)$ 4. A) $\lim\_{x\to 1^{-}}f\left(x\right)$ B) $\lim\_{x\to 1^{+}}f\left(x\right)$



Three ways that a limit fails to exist!

1.

 Example: $\lim\_{x\to 3}f\left(x\right)$

2.

Examples: $\lim\_{x\to 0}f\left(x\right)$ $\lim\_{x\to 0}f\left(x\right)$



3.

 Example: $\lim\_{x\to 0}\cos(\frac{π}{x})$

**Find each Limit Using a Table:**

**2nd window for Table Setup, change indpnt to ASK**

1. $\lim\_{x\to 2}\frac{x^{2}-4}{x-2}$ **2.** $\lim\_{x\to 0}\frac{\sqrt{x+5}-\sqrt{5}}{x}$

|  |  |
| --- | --- |
| **x** | **y** |
| 1.9 |  |
| 1.99 |  |
| 1.999 |  |
| 2.001 |  |
| 2.01 |  |
| 2.1 |  |

|  |  |
| --- | --- |
| **x** | **y** |
| -0.1 |  |
| -0.01 |  |
| -0.001 |  |
| 0.001 |  |
| 0.01 |  |
| 0.1 |  |

Table Setup – Start: c, ΔTbl: .001 Indnt: AUTO

**3.** $\lim\_{x\to -1}\frac{x^{2}-1}{x+1}$ **4.** $\lim\_{x\to 0}\frac{\left|x\right|}{x}$

5. $\lim\_{x\to \frac{π}{2}}cos x-2$