Finding Limits Graphically and Numerically

1. Complete the table and use the result to estimate the limit. Use a graphing utility to graph the function to confirm your result (similar to p.74 #1-9)

$$\lim_{x\to 2}\left(x^2-3x-2\right)$$

x	1.9	1.99	1.999	2	2.001	2.01	2.1
f(x)				?			

2. Complete the table and use the result to estimate the limit. Use a graphing utility to graph the function to confirm your result (similar to p.74 #1-9)

$$\lim_{x\to 5}\left(\frac{x^2-25}{x-5}\right)$$

x	4.9	4.99	4.999	5	5.001	5.01	5.1
f(x)				?			

3. Create a table of values for the function and use the result to estimate the limit. Use a graphing utility to graph the function to confirm your result (similar to p.75 #11-15)

$$\lim_{x\to 0}\left(\frac{\tan(x)}{x}\right)$$

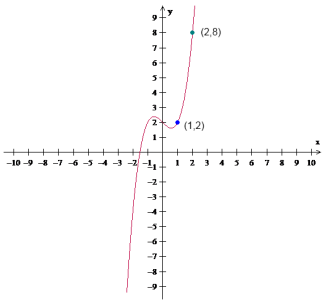
4. Create a table of values for the function and use the result to estimate the limit. Use a graphing utility to graph the function to confirm your result (similar to p.75 #11-15)

$$\lim_{x\to 2}\left(\frac{x^2-5x+6}{x-2}\right)$$

5. Use the graph of f(x) to find the limit (if it exists) (similar to p.75 #17-27)

$(a)\quad \lim_{x\to 1} f(x)$

$(b)\quad \lim_{x\to 2} f(x)$

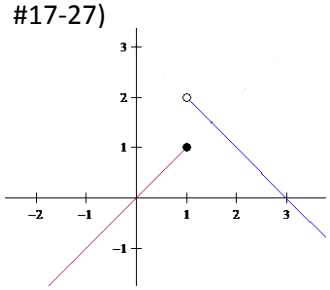


6. Use the graph of f(x) to find the limit where c = 1 (if it exists) (similar to p.75 #17-27)

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

$(b)\ \lim_{x\to c^-} f(x)$

$(c)\ \lim_{x\to c} f(x)$



7. Find the limit L. Then find δ > 0 (delta) such that |f(x) – L| < 0.01 whenever 0 < |x – c| < δ (similar to p.77 #41-43)

$$\lim_{x\to 2}(5x-1)$$

Find the limit L. Then find δ > 0 (delta) such that |f(x) – L| < 0.01 whenever 0 < |x – c| < δ

1. Identify c, f(x), and L
2. Plug in c into |x – c|
3. Plug f(x) and L into |f(x) – L| < 0.01 and get the absolute value by itself such that it looks like |x–c|, then the other side is δ

On some problems the 0.01 gets replaced by epsilon: ε

8. Find the limit L. Then use the ε-δ definition to prove that the limit is L. (similar to p.77 #45-55)

$$\lim_{x\to 4}(2x+1)$$

Plug in f(x), c, and L into |f(x) – L| < ε when 0 < |x–c|<δ and get the absolute values by themselves and find δ