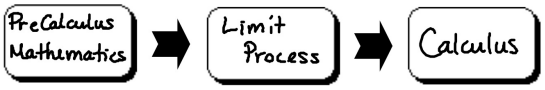
DO NOW

Read pg 62 - 64

2.1 A Preview of Calculus



Precalculus mathematics is more: static

Calculus is more: dynamic

Tangent line problem - pg 65

"Derivatives"

The area problem - pg 66

"Integrals"

Pg 67; 1 - 6 orally

2.2 Finding Limits Graphically and Numerically

$\lim_{x \to c} f(x) = L$ "The limit of f(x) as x approaches c is L."

You can think of the function f(x) as containing the coordinate (c, L) EXCEPT that f(x) only has to be approaching L → it doesn't have to be at L.

Note: the existence or nonexistence of f(x) at x=c has no bearing on existence of the $\lim_{x \to c} f(x)$

Examples:

1. $\lim_{x \to 1} \frac{x^3 - 1}{x - 1}$, $x \neq 1$

x	.9	.999	1	1.001	1.1
f(x)	2.71	2.992	und ?	3.003	3.31

as $x \to 1$, $f(x) \to 3$

$\lim_{x \to 1} \frac{x^3 - 1}{x - 1} = 3$

2. $f(x) = \frac{x^2 + 2x - 8}{2(x - 2)}$

table of values:

x	-2	-1	0	1	2	3	4
f(x)	1	1.5	2	2.5	error	3.5	4

Limit Process

$\lim_{x \to 2} \frac{x^2 + 2x - 8}{2(x - 2)} = 3$

x	1.95	1.98	2	2.02	2.05
f(x)	2.975	2.99	error und.	3.01	3.025

$\lim_{x \to 0} \frac{x^2 + 2x - 8}{2(x - 2)} = 2$

$\frac{0^2+2(0)-8}{2(0-2)}$

$\frac{-8}{-4} = 2$

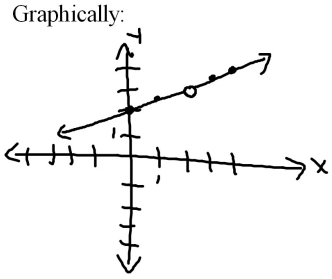
$\lim_{x \to 4} \frac{x^2 + 2x - 8}{2(x - 2)} = 4$

$\frac{4^2+2(4)-8}{2(4-2)}$

$\frac{16+8-8}{2(2)}$

$\frac{16}{4} = 4$

Graphically:



HOMEWORK

pg 74 - 75; 1 - 9 odd