Good afternoon: warm up in notes

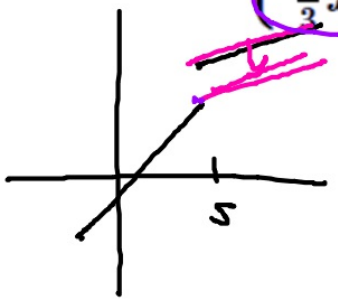
1. $$f(x) = \begin{cases} 2x+3, & x < 4 \\ 5x-9, & x \geq 4 \end{cases}$$ Find $\lim_{x \to 4} f(x)$ = 11

$\lim_{x \to 4^-} 2x+3$ → 11

$\lim_{x \to 4^+} 5x-9$ → 11

2. Determine the value of b so that $\lim_{x \to 5} f(x)$ exists.

$$f(x) = \begin{cases} 2x-3, & x < 5 \\ \frac{2}{3}x+b, & x \geq 5 \end{cases}$$



$\lim_{x \to 5^-} f(x) = 2(5)-3 = 7$

$\lim_{x \to 5^+} \frac{2}{3}x+b$

$\frac{2}{3} \cdot 5 + b$

$\frac{21}{3} = \frac{10}{3} + b$

$\frac{11}{3} = b$

Senior Lunch forms will only be signed if passing

You can retake in DS and turn in the form later this week

Look over assessments with your partners

- What questions do they have?
- What questions of theirs can you answer?
- What questions do you still have?

Properties of limits:

NOTES

Mostly Common Sense:

e.g:

- $\lim_{x \to a} [f(x) + g(x)]$

$= \lim_{x \to a} f(x) + \lim_{x \to a} g(x)$

$\lim_{x \to a} \frac{f(x)}{g(x)}$, $g(x) \neq 0$

$= \frac{\lim_{x \to a} f(x)}{\lim_{x \to a} g(x)}$

$\lim_{x \to a} c \cdot f(x)$, $c \in \mathbb{R}$

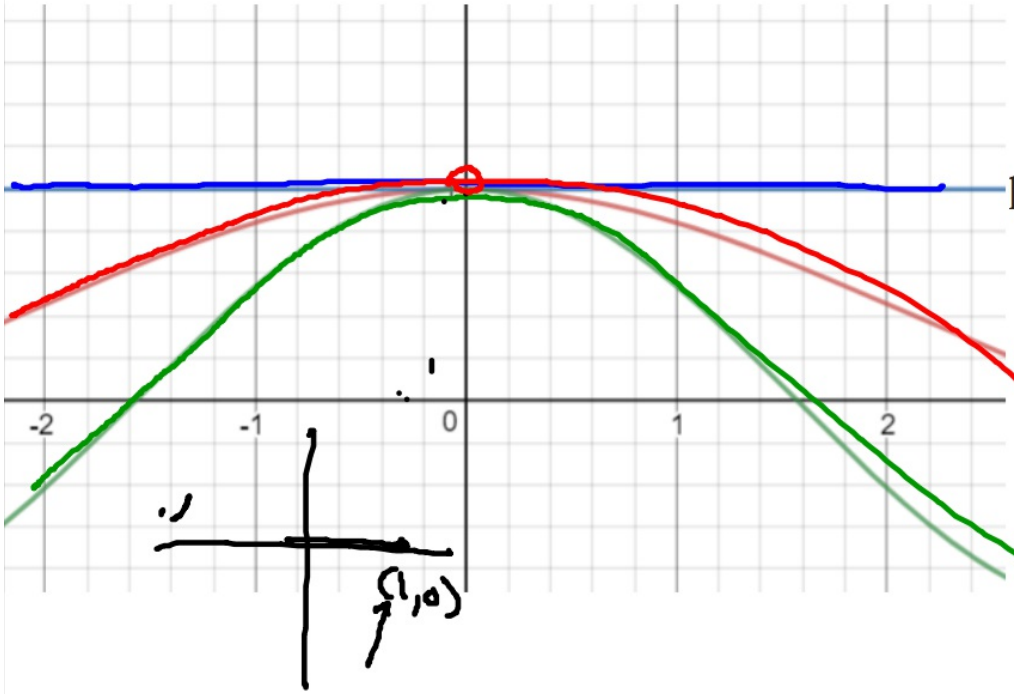
"c element of" ... Real Numbers

$= c \cdot \lim_{x \to a} f(x)$

ex: $\lim_{x \to 3} 2x^2$

$2 \cdot \lim_{x \to 3} x^2$

Let's retry Special Trig Limits again -_-



h(x)=1

g(x)= $\frac{\sin(x)}{x}$

f(x)=cos(x)

$f(x) \le g(x) \le h(x)$ around 0

$\lim_{x \to 0} f(x) \le \lim_{x \to 0} g(x) \le \lim_{x \to 0} h$

$1 \le \lim_{x \to 0} \frac{\sin x}{x} \le 1$

$= 1$

Two Rules to memorize:

$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

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

$$\lim_{x\to 0}\frac{\sin(3x)}{x}\cdot\frac{3}{3}$$

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

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

$$\lim_{x\to 0}\frac{\sin 3x}{3x} = 1$$

$$3\cdot 1$$

$$3$$

$$\sin(3x) \neq 3\sin(x)$$

$$= 3$$

$$\lim_{x \to 0} x \csc x$$

$$= \frac{1}{\sin x}$$

$$\lim_{x \to 0} x \cdot \frac{1}{\sin x}$$

$$\lim_{x \to 0} \frac{x}{\sin x} = 1$$

$$\sec\theta = \frac{1}{\cos\theta}$$

$$\cot\theta = \frac{1}{\tan\theta}$$

$\frac{1}{2}$, 0, dne

$$\lim_{x\to 0}\frac{\tan 2x}{x}$$

$$\lim_{x\to 0}\frac{\frac{\sin 2x}{\cos 2x}}{x}$$

$$\lim_{x\to 0}\frac{\sin 2x}{x\cos x}$$

$$\lim_{x\to 0}\frac{\sin 2x}{x}\cdot\frac{1}{\cos 2x}$$

$$\lim_{x\to 0}\frac{\sin 2x}{x}\cdot\lim_{x\to 0}\frac{1}{\cos 2x}$$

$$2\cdot 1 = 2$$

Homework

watch and take notes on my video posted at mcalc.weebly.com