September 15, 2025

Make a Hat Day

Today in History:

James Madison marries Dolley Payne Todd (1794)

Famous Marilyn Monroe “skirt” scene filmed (1954)

Number of the Day: 22

22 = 2 x 11

22 is the smallest number that can be expressed as the sum of two primes in three ways.

Fun Fact:

A Squircle is a square with rounded edges.

Quote of the Day:

“It is more fun to talk with someone who doesn't use long, difficult words but rather short, easy words like "What about lunch?”

A.A. Milne

Today’s Weather:

Partly cloudy, high 78^{o}

Math 121

Quiz #11

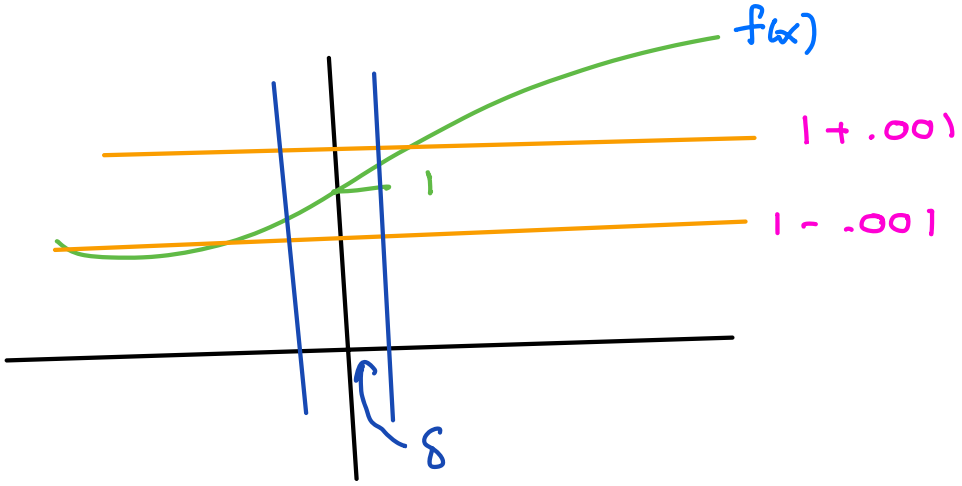
Pick up Blue Book.

TEST 1 REVIEW

Pg 117 # 13

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

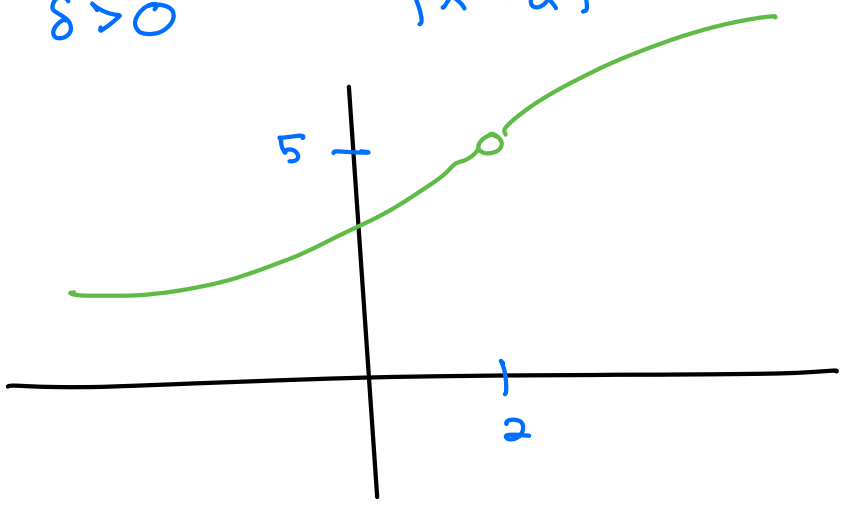
$$f(x) = \frac{e^x - 1}{x} \qquad |f(x) - 1| < .001$$



F 2024 (5h)

$$\lim_{x \to 2} f(x) = 5$$

$\delta > 0$ $\qquad |x - 2| < \delta$ $\qquad f(x) = 5$



FALSE

F 2018

3c $\lim_{x \to 3^-} \dfrac{x^2 - x - 6}{|x^2 - 9|}$

$= \lim_{x \to 3^-} \dfrac{(x-3)(x+2)}{|(x-3)(x+3)|} = -\dfrac{5}{6}$

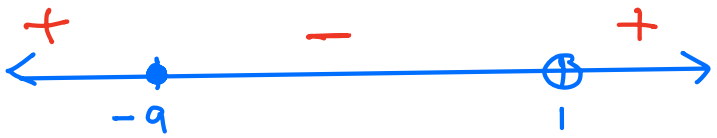
$\lim_{x \to 3^-} \dfrac{x-3}{|x-3|} = -1$

TJR1

#2 $f(x) = \sqrt{\dfrac{x+9}{x-1}}$ DOMAIN

$\sqrt{}$ OF NEG DIV. BY 0

$\dfrac{x+9}{x-1} \geq 0$



$x+9=0$

$x-1=0$

$(-\infty, -9] \cup (1, \infty)$

TJR1

#28 $f(x) = 7x+5$ $x=-1$

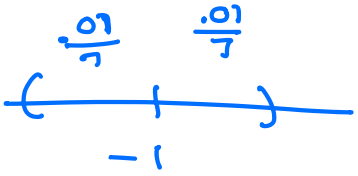
$\lim_{x \to -1} (7x+5) = -2$

$|7x+5+2| < .01$

$|7x+7| < .01$

$|x+1| < \dfrac{.01}{7}$

$|x-(-1)| < \dfrac{.01}{7}$



$\left(-1 - \dfrac{.01}{7}, -1 + \dfrac{.01}{7}\right)$

(29) $\lim_{x \to -1} (7x+5) = -2$

$|7x+5+2| < \varepsilon$

$|7x+7| < \varepsilon$

$|x+1| < \frac{\varepsilon}{7}$

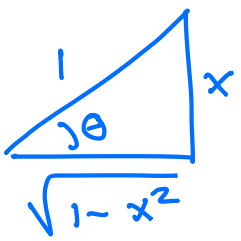
$|x-(-1)| < \frac{\varepsilon}{7}$

$\left(-1-\frac{\varepsilon}{7}, -1+\frac{\varepsilon}{7}\right)$

F2024

(20) $\cos(\underbrace{\text{ARCSIN}\, x}_{\theta}) = \cos(\theta) = \sqrt{1-x^2}$

$\theta = \text{ARCSIN}\, x$ $\quad \sin\theta = x$



(b)

mpod #9

(9) $\lim_{x \to \infty} \left(x - \sqrt{x^2+x}\right)\left(\frac{x+\sqrt{x^2+x}}{x+\sqrt{x^2+x}}\right)$

$= \lim_{x \to \infty} \frac{x^2 - (x^2+x)}{x+\sqrt{x^2+x}} = \lim_{x \to \infty} \frac{-x}{1x+\sqrt{1x^2+x}}$

$= \frac{-1}{2}$

(10) $\lim_{x\to-\infty} \frac{|x|-x}{x+1} = \lim_{x\to-\infty} \frac{-x-x}{x+1}$

$$|x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}$$

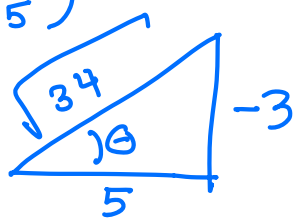
$= \lim_{x\to-\infty} \frac{-2x}{x+1} = \frac{-2}{1}$

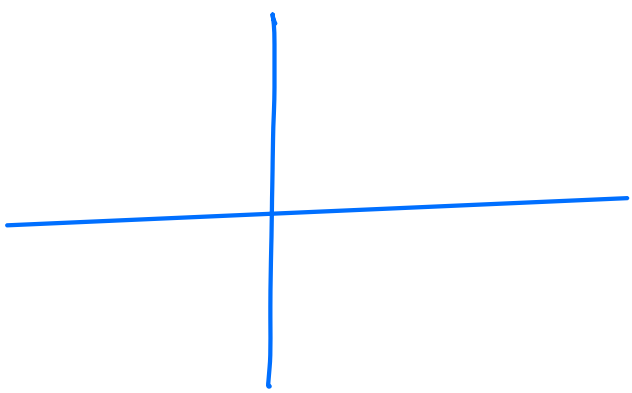
$= -2$

T1R1 #10 $\sin(\arctan(-\frac{3}{5})) = \frac{-3}{\sqrt{34}}$ $\leq\theta\leq$

$\theta = \arctan(\frac{-3}{5})$

$\tan\theta = -\frac{3}{5}$





F2022 4d $\lim_{x\to\infty} x - \sqrt{x^2+7x}\left(\frac{x+\sqrt{x^2+7x}}{x+\sqrt{x^2+7x}}\right)$

$= \lim_{x\to\infty} \frac{x^2-(x^2+7x)}{x+\sqrt{x^2+7x}} = \lim_{x\to\infty} \frac{-7x}{x+\sqrt{x^2+7x}}$

$= \frac{-7}{2}$

MPOD #11

(7)

$$\lim_{x \to 2} x^2 = 4$$

$|x^2 - 4| < \varepsilon$

$|(x-2)(x+2)| < \varepsilon$

$x \leq 3$

$x + 2 \leq 5$

$|(x-2)(x+2)| < |(x-2)5| < \varepsilon$

$|x-2| < \frac{\varepsilon}{5} = \delta$

#2024

4b

$$\lim_{x \to 0} \frac{(\tan 4x)(\cos 3x)}{(\sin 2x)(\cos x)}$$

$$= \lim_{x \to 0} \frac{\sin 4x}{\cos 4x} \cdot \frac{\cos 3x}{1} \cdot \frac{1}{\sin 2x} \cdot \frac{1}{\cos x}$$

$$= \lim_{x \to 0} \frac{\sin 4x}{4x} \cdot \frac{1}{\cos 4x} \cdot \frac{\cos 3x}{1} \cdot \frac{2x}{\sin 2x} \cdot \frac{1}{\cos x} \cdot \frac{4x}{2x}$$

$= 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 2$

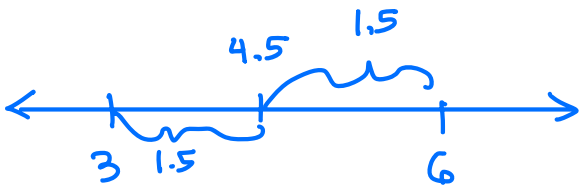
$= 2$

F 2023

(1a)

$3 \leq x \leq 6$

$|x - a| \leq b$



$|x - 4.5) \leq 1.5$

$a = 4.5$

$b = 1.5$