August 29, 2025

Individual Rights Day

Today in History:

Hurricane Katrina slams into Gulf Coast (2005)

Michael Jackson is born (1958)

Number of the Day: 4236

4236 = 2 x 2 x 3 x 353

4236 is a number divisible by each of its digits.

Fun Fact:

On Sunday, it is illegal to sell cornflakes in Columbus, Ohio.

Quote of the Day:

"I'm sorry, if you were right, I'd agree with you."

— Robin Williams

Today's Weather:

Cloudy skies early, high 64°.

Math 121

Quiz #3

For

$$f(x) = \frac{3x+2}{5x-1}$$

find $f^{-1}(x)$

$y = \frac{3x+2}{5x-1}$ $\qquad x = \frac{3y+2}{5y-1}$

$x(5y-1) = 3y+2$

$5xy - x = 3y+2$ $\qquad 5xy - 3y = x+2$

$y(5x-3) = x+2$

$y = \frac{x+2}{5x-3}$

$f^{-1}(x) = \frac{x+2}{5x-3}$

Pg 43 # 29

$\cos^{-1} 1 = \arccos(1) = 0$

MPOD #3

PROB 7

$\sinh(\ln 5)$

$\sinh x = \dfrac{e^x - e^{-x}}{2}$

$\sinh(\ln 5) = \dfrac{e^{\ln 5} - e^{-\ln 5}}{2}$

$= \dfrac{e^{\ln 5} - e^{\ln(5^{-1})}}{2}$

$= \dfrac{5 - \frac{1}{5}}{2} = \dfrac{\frac{25}{5} - \frac{1}{5}}{2} = \dfrac{\frac{24}{5}}{2}$

$= \dfrac{12}{5}$

Pg 43 (4a) $f(x) = \dfrac{x-2}{x+3}$ $y = \dfrac{x-2}{x+3}$

$x = \dfrac{y-2}{y+3}$

$x(y+3) = y - 2$

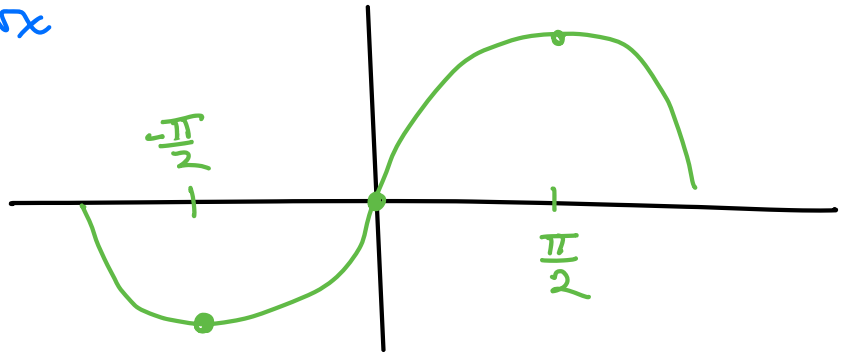
$xy + 3x = y - 2$

$xy - y = -3x - 2$

$y(x-1) = -3x - 2$

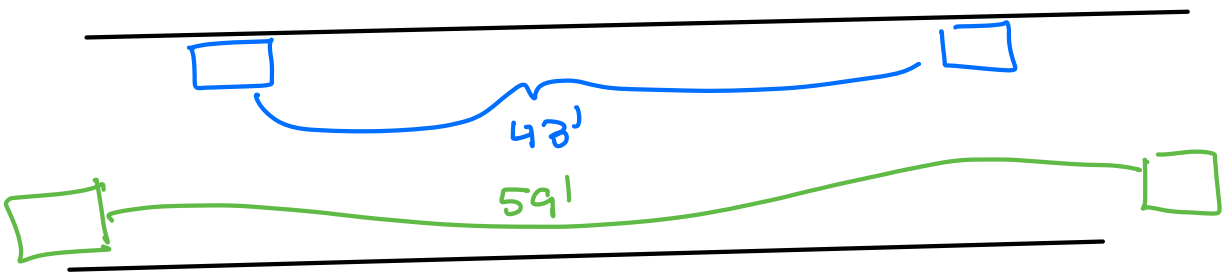
$y = \dfrac{-(3x+2)}{x-1}$

(3) $y = \sin x$



AVE. VEL. = $\frac{\text{CHANGE POSITION}}{\text{CHANGE TIME}}$

.8 SEC



$\frac{43'}{.8\text{SEC}} \quad \frac{1 \text{ MILE}}{5280'} \quad \frac{3600\text{SEC}}{1\text{HR}} = 36.6 \text{ mph}$

$\frac{59'}{.8s}$ . . . 50mph

POSITION $S(t) = 5t^2$

AVE $V[1,2] = \frac{S(2) - S(1)}{2-1} = \frac{20-5}{1} = 15$

AVE $V[1, 1.5] = \frac{S(1.5) - S(1)}{1.5 - 1} = 12.5$

VELCO. $t=1 = \frac{S(1) - S(1)}{1-1}$

↑ BAD WORD

LIMITS

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

WHEN x "GETS CLOSE" TO c

$f(x)$ GETS CLOSE TO L

EXAMPLE $\lim_{x \to 1} \dfrac{x^2 - 1}{x - 1}$

$= 2$

x	$\frac{x^2-1}{x-1}$
2	3
1.5	2.5
1.1	2.1
1.01	2.01
.9	1.9
.99	1.99

EXAMPLE $\lim_{x \to 4} \dfrac{\sqrt{x} - 2}{x - 4}$

$= .25 = \dfrac{1}{4}$

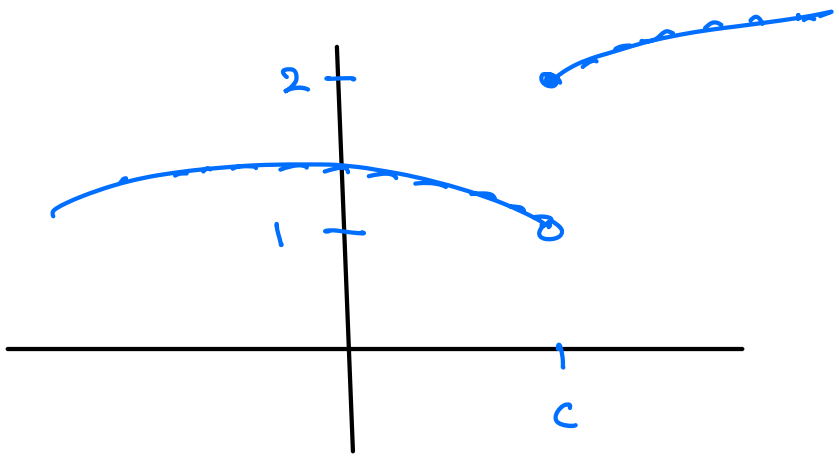
x	$\frac{\sqrt{x}-2}{x-4}$
5	.236
4.01	.248
4.001	.2498
3.9	.251
3.99	.2501

RULES

① $\lim_{x \to c} k = k$

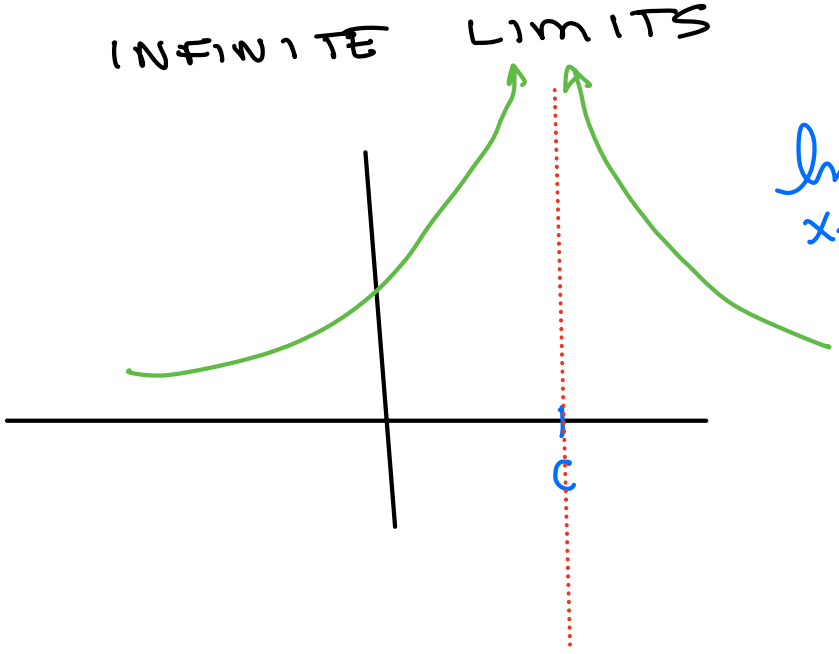
② $\lim_{x \to c} x = c$

ONE-SIDED LIMITS

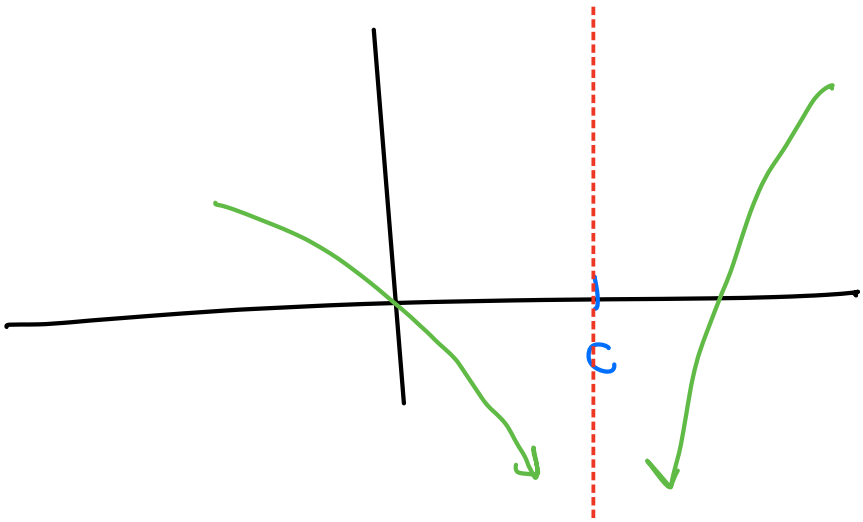


$\lim_{x \to c^-} f(x) = 1$ $\lim_{x \to c^+} f(x) = 2$

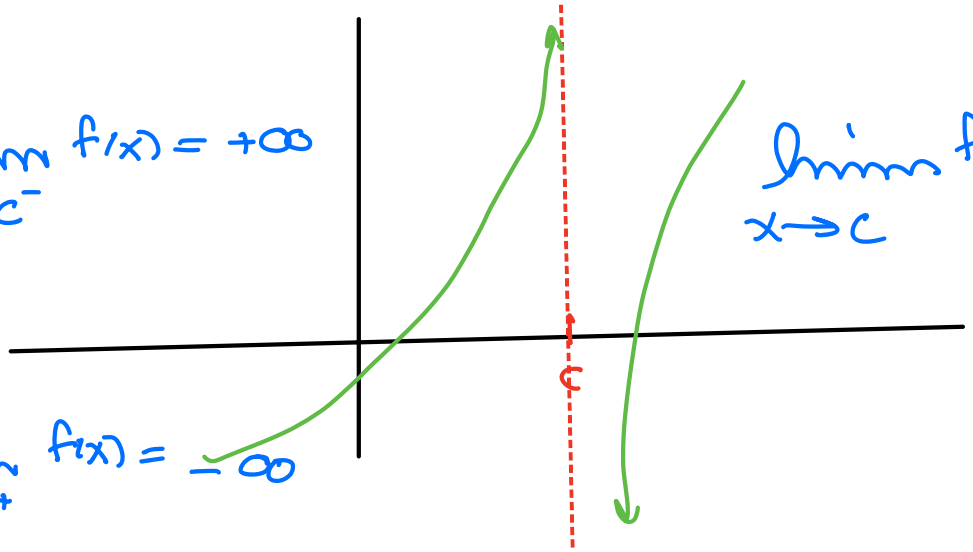
INFINITE LIMITS



$\lim_{x \to c} f(x) = +\infty$



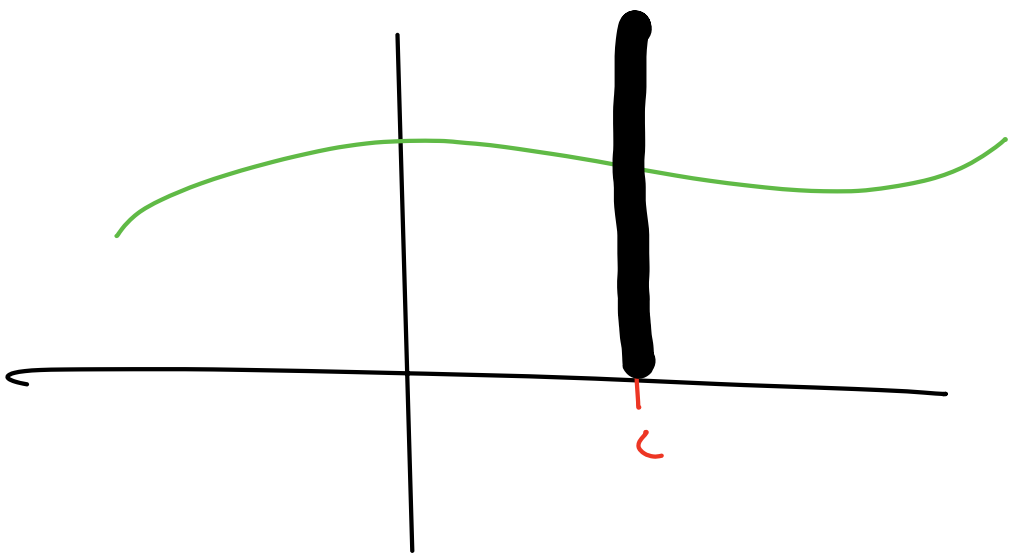
$\lim_{x \to c} f(x) = -\infty$



$\lim_{x \to c^-} f(x) = +\infty$

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

$\lim_{x \to c^+} f(x) = -\infty$



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