

August 28, 2026

National Cherry Turnover Day

Today in History:

"I Have a Dream" speech (1963)

Charles and Diana divorce (1996)

Number of the Day: 3221

3221 is prime

3221 is a number n such that googol - n is prime.

Fun Fact:

The first oranges were green.

Quote of the Day:

"Creativity is intelligence having fun."

- Albert Einstein

Today's Weather:

Clouds this morning, generally sunny skies this afternoon, high 74°

Math 121

Quiz #3

For

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

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

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

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

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

$$xy + 3x = y - 2$$

$$xy - y = -3x - 2$$

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

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

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

mpod *3 PROBLEM 6

$$\text{LOG}_3 x + 3 \text{LOG}_3 (x^2) = 14$$

$$\text{LOG}_3 x + 6 \text{LOG}_3 x = 14$$

$$7 \text{LOG}_3 x = 14$$

$$\text{LOG}_3 x = 2$$

$$x = 3^2 = 9$$

⑧ $\text{TANH}(3 \ln 5)$

$$\text{TANH } x = \frac{\sinh x}{\cosh x} = \frac{\frac{e^x - e^{-x}}{2}}{\frac{e^x + e^{-x}}{2}}$$

$$\text{TANH } x = \frac{e^x - e^{-x}}{e^x + e^{-x}}$$

$$\text{TANH}(3 \ln 5) = \frac{e^{3 \ln 5} - e^{-3 \ln 5}}{e^{3 \ln 5} + e^{-3 \ln 5}}$$

$$= \frac{e^{\ln 5^3} - e^{\ln 5^{-3}}}{e^{\ln 5^3} + e^{\ln 5^{-3}}} = \frac{5^3 - \frac{1}{5^3}}{5^3 + \frac{1}{5^3}} \left(\frac{5^3}{5^3} \right)$$

$$= \frac{5^6 - 1}{5^6 + 1}$$

LIMITS

CLEVE $\rightarrow$ CIN. 180 miles

$$\frac{3 \text{ HOURS}}{\Delta \text{ Time}} = \frac{180 \text{ miles}}{3 \text{ HOURS}} = 60 \text{ mph}$$

CLEVE - COLVB. 90 miles

$$\frac{2 \text{ HOURS}}{2} = 45 \text{ mph}$$

CLEVE $\rightarrow$ MEDINA

$$\frac{60 \text{ miles}}{1 \text{ HOUR}} = 60 \text{ mph}$$

CLEVE - 1 MILE.

$$\frac{30 \text{ SEC.}}{30 \text{ SEC.}} \times \frac{1 \text{ MIN}}{60 \text{ SEC.}} \times \frac{1 \text{ HOUR}}{60 \text{ MIN.}}$$

$$= 120 \text{ mph}$$

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

WHEN x "GETS CLOSE" TO c
 $f(x)$ "GETS CLOSE" TO L

DON'T MEAN $x = c$

$$\lim_{x \rightarrow 2} x + 3 = 5$$

x	$f(x)$
3	6
2.1	5.1
2.001	5.001
1.9	4.9
1.999	4.999

$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = 2$$

x	$f(x)$
2	3
1.5	2.5
1.1	2.1
1.01	2.01
.9	1.9
.99	1.99

$$\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$$

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

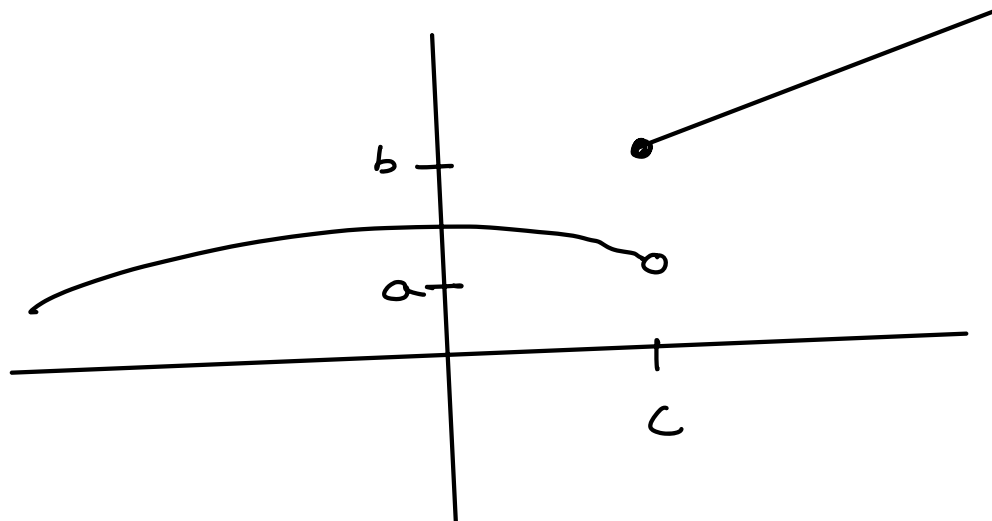
x	f(x)
5	.236
4.01	.248
4.001	.2498
3.9	.251
3.99	.2501

RULES

$$\textcircled{1} \lim_{x \rightarrow c} k = k$$

$$\textcircled{2} \lim_{x \rightarrow c} x = c$$

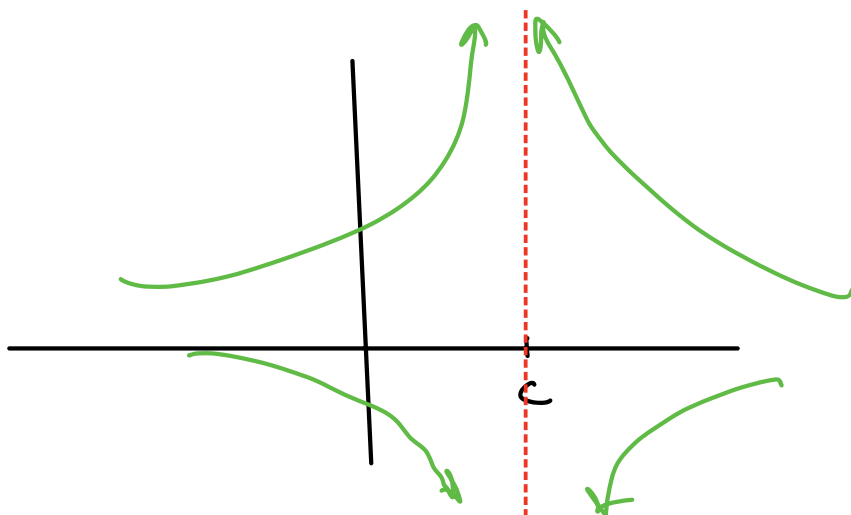
ONE-SIDED LIMITS



$$\lim_{x \rightarrow c^-} f(x) = a$$

$$\lim_{x \rightarrow c^+} f(x) = b$$

INFINITE LIMITS

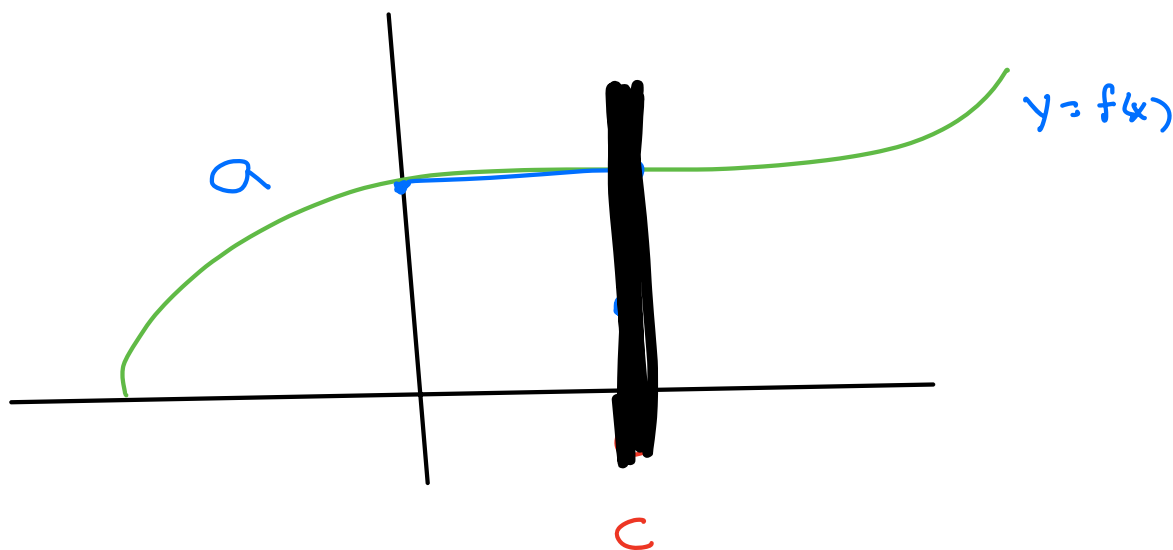


$$\lim_{x \rightarrow c^-} f(x) = +\infty$$

$$f(x) = +\infty$$

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

$$\lim_{x \rightarrow c} f(x) = \text{D.N.E.}$$



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