September 2, 2025

Calendar Adjustment Day

Today in History:

First ATM opens (1969)

The Great Fire of London begins (1666)

Number of the Day: 2708

2708 = 2 x 2 x 677

2708 is the number of partitions of 84 into distinct parts, where the difference between the number of odd parts and the number of even parts is 5

Fun Fact:

The letters J and K are not used if you spell out any number individually.

Quote of the Day:

"If the Good Lord intended for us to walk, he wouldn't have invented roller skates."

Gene Wilder - "Willy Wonka & The Chocolate Factory"

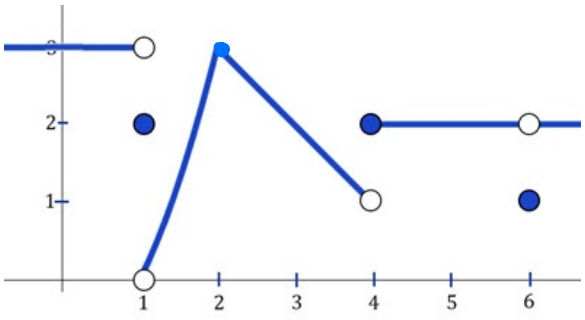
Today's Weather:

Sunshine and clouds mixed, High 77°.

Math 121

Quiz #4

Use the graph below of $f(x)$ to find:



1. $\lim_{x \to 2} f(x)$ = 3

2. $\lim_{x \to 4^-} f(x)$ = 1

3. $\lim_{x \to 4^+} f(x)$ = 2

4. $\lim_{x \to 6} f(x)$ = 2

Pg 65 #3

$$s(t) = 22t + 17$$

$t = 2 \to t = 3$

$$v_{AVE} = \frac{\Delta s}{\Delta t} = \frac{s(3) - s(2)}{3 - 2}$$

$$= \frac{83 - 61}{1} = 22$$

$t = 2.5$ $\quad v_{AVE} = \dfrac{\Delta s}{\Delta t} = \dfrac{s(t) - s(2.5)}{t - 2.5}$

t	v_{AVE}
3	22
2.6	22
2.51	22
2.5001	22

$= 22.$

Pg 73 #13

$$\lim_{x \to 4} 3x - 12$$

x IS CLOSE TO 4

$3x$ IS CLOSE TO 12

$|x - 4|$ IS SMALL

$|3x - 12|$ IS SMALL

$$|3x - 12| = |3(x - 4)| = 3|x - 4|$$

LIMIT LAWS OR RULES

① $\lim_{x \to c} K = K$

② $\lim_{x \to c} x = c$

IF $\lim_{x \to c} f(x) = L$ $\quad \lim_{x \to c} g(x) = M$

③ $\lim_{x \to c} (f(x) \pm g(x)) = L \pm M$

④ $\lim_{x \to c} K f(x) = K L$

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

⑤ $\lim_{x \to c} (f(x))(g(x)) = L \cdot M$

⑥ $\lim_{x \to c} \frac{f(x)}{g(x)} = \frac{L}{M}$ $\quad M \neq 0$

⑦ $\lim_{x \to c} (f(x))^N = L^N$

$= \lim_{x \to c} (f(x))^N = \left(\lim_{x \to c} f(x) \right)^N$

⑧ $\lim_{x \to c} \sqrt[N]{f(x)} = \sqrt[N]{L}$ IF OK.

EXAMPLE 1

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

EXAMPLE 2

$$\lim_{x \to 1} (x^2 + 2x + 5) = 8$$

EXAMPLE 3

$$\lim_{x \to 1} \sqrt{x^2 + x + 2} = 2$$

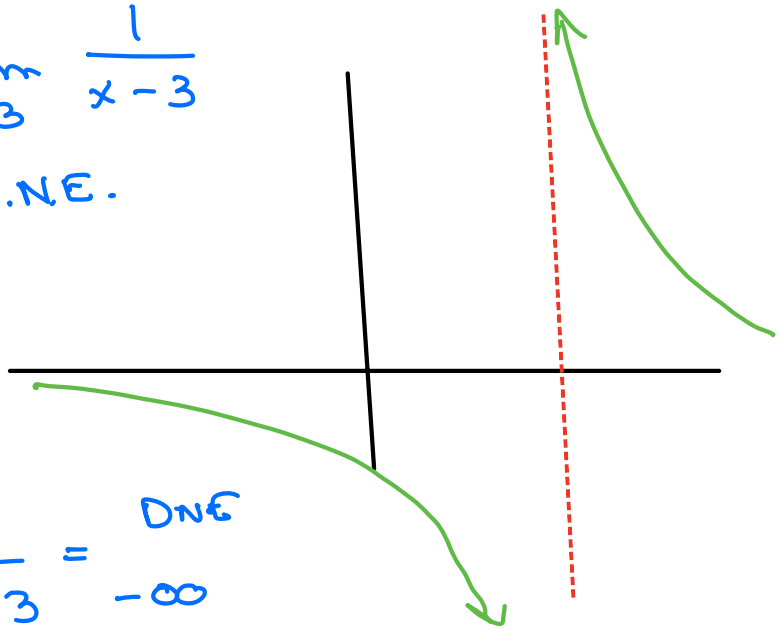
EXAMPLE 4

$$\lim_{x \to 5} \frac{x^3}{7x+1} = \frac{125}{36}$$

EXAMPLE 5

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

$= \text{D.N.E.}$

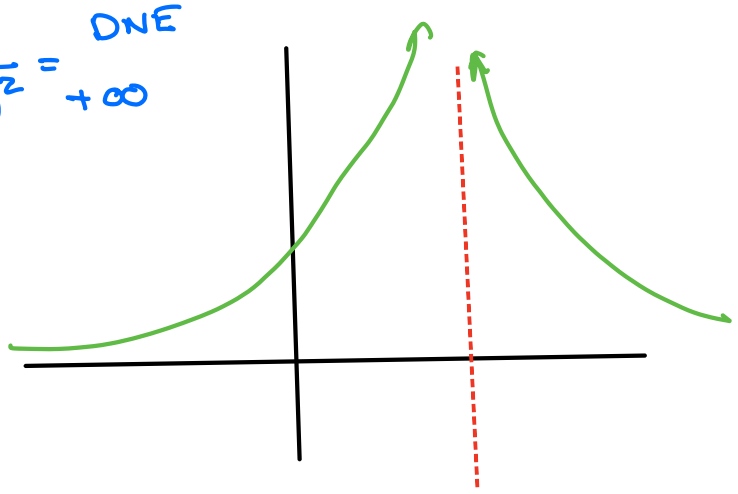


$$\lim_{x \to 3^-} \frac{1}{x-3} = -\infty \quad \text{DNE}$$

$$\lim_{x \to 3^+} \frac{1}{x-3} = +\infty \quad \text{DNE}$$

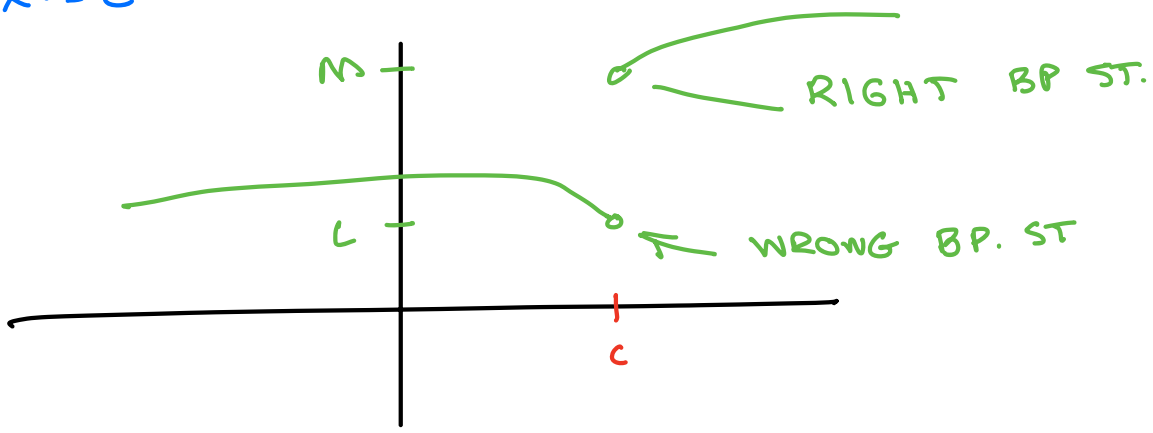
EXAMPLE 6

$$\lim_{x \to 3} \frac{1}{(x-3)^2} = +\infty$$ DNE



ONE SIDED LIMITS

$$\lim_{x \to c^-} f(x) = L \qquad \lim_{x \to c^+} f(x) = M$$



$$L \neq M$$

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

EXAMPLE 7

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