



**Universidad del sureste**

**Campus Comitán**

**Licenciatura en Medicina Humana**

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**Grupo: "B"**

**Grado: Segundo semestre**

**Materia: Biomatemáticas**

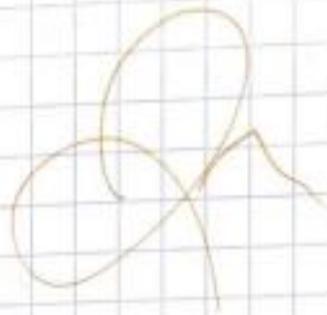
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## Biomatemáticas I

Uso de herramientas de las matemáticas para el análisis de cuestiones y temas biológicos.

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



Ejercicios

$$\lim_{x \rightarrow 2.5} x^2 = 6.25$$

$$\lim_{x \rightarrow 1.5} x^2 = 2.25$$

$$\lim_{x \rightarrow 3} x^2 = 9$$

$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = 0$$

# Límites

## Biomatemáticas

$$\lim_{x \rightarrow a} C = C$$

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

$$\lim_{x \rightarrow a} \sqrt{x} = \sqrt{a}$$

$$\lim_{x \rightarrow a} x = a$$

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

$$\lim_{x \rightarrow 8} 6x^2 = 6(8)^2 = 6(64) = 384$$

$$\lim_{x \rightarrow a} x^n = a^n$$

$$\lim_{x \rightarrow 2} x^2 = (2)^2 = 4$$

$$\lim_{x \rightarrow 0} 6x^2$$

# Biomatematicas

## Ejercicios

$$1. \lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x - 2}$$

$$\text{Sub } (2)^2 + 2 - 6 \\ 2 - 2 \\ 4 + 2 - 6$$

$$\lim_{x \rightarrow 2} (x-2)(x+3) = x+3 \\ \frac{x-2}{x-2} \\ = 2+3 = 5$$

$$\frac{6-6}{0} = \frac{0}{0}$$

$$\lim = 5$$

$$2. \lim_{x \rightarrow -4} \frac{x^2 + 5x + 4}{x^2 + 3x - 4}$$

$$\lim = \frac{(x+4)(x+1)}{(x+4)(x+1)}$$

$$\frac{(x+1)}{(x+1)} = \frac{4+1}{4-1} = \frac{3}{-5}$$

$$\lim \frac{-3}{-5} = 0.6$$

$$3. \lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$$

$$\lim_{x \rightarrow 2} \frac{(x-2)(x+2)}{x-2}$$

$$\lim = 4$$

$$x \rightarrow 2 = 2 + 2 = 4$$

# Biomatemáticas

$$\lim_{x \rightarrow \text{PH}} x^2$$

$$(\text{PH } 6.6)^2 = 43.56$$

$$(\text{PH } 7.6)^2 = 57.76$$

$$(\text{PH } 7.8)^2 = 60.8$$

$$(\text{PH } 8)^2 = 64$$

$$(7.6) = 438$$

$$78 = 474.502$$

$$8 = 4096$$

NCM

MOD

429

4096	2
2048	2
1024	2
512	2
256	2
128	2
64	2
32	2
16	2
8	2
4	2
2	2
1	2

$$2 = 10^1$$

$$2 = 10^0$$

# BIOMATEMÁTICAS

XVII. VI. XXII

$$\lim_{x \rightarrow 2} (4x-1)(3x)$$

$$\lim_{x \rightarrow 4} 3x = 6x \quad \lim_{x \rightarrow 4} 3(4) = 12 \quad \lim_{x \rightarrow 4} 6(4) = 24$$

$$288 \neq$$

$$\lim_{x \rightarrow 4} \frac{3x}{4x} = \frac{3 \lim_{x \rightarrow 4} x}{4 \lim_{x \rightarrow 4} x} = \frac{12}{16} = 0.75$$

$$\lim_{x \rightarrow 5} \frac{3x-12}{4x-19} = \frac{\lim_{x \rightarrow 5} (3x-12)}{\lim_{x \rightarrow 5} (4x-19)} = \frac{15-12}{20-19} = \frac{3}{1} = 3$$

$$\lim_{x \rightarrow a} [f(x)]^n = \left[ \lim_{x \rightarrow a} f(x) \right]^n$$

$$\lim_{x \rightarrow a} \sqrt[n]{x} = \lim_{x \rightarrow a} \sqrt[n]{x}$$
$$\lim_{x \rightarrow 2} \sqrt[3]{4x} = \sqrt[3]{4(2)} = \sqrt[3]{8} = 2$$

# BIOMATEMÁTICAS

Límites laterales

+ → Derecho  
- → Izquierda

• Cuando X se acerca a C por la derecha

$$\lim_{x \rightarrow a^+} f(x) \text{ ó } \lim_{x \rightarrow a^+} \frac{f(x)}{g(x)}$$

$$\lim_{x \rightarrow 2} f(x)$$

$$f(x) = \begin{cases} x^2 & \text{si } x < 2 & (2)^2 = 4 \\ 4 & \text{si } x = 2 & 4 \cdot 1 = 4 \\ 6 - 2x & \text{si } x > 2 & 6 - 4 = 2 \end{cases}$$

Calcula

$$\lim_{x \rightarrow 1} f(x)$$

$$f(x) = \begin{cases} x^2 + 1 & \text{si } x < 1 & (1+1) = 2 \\ 2x & \text{si } x > 1 & (1+1) = 2 \end{cases}$$



csat  $O^2$  Hb?

$pO_2$  80mmHg

Pil: Constante

$x = k$

1. PH: 6

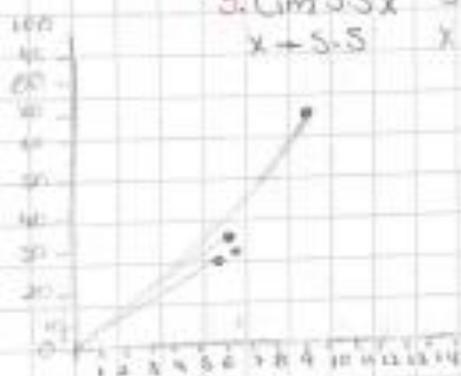
2. PH: 9

3. pH: 5.5

$$1. \lim_{x \rightarrow 6} 6x = \lim_{x \rightarrow 6} f(x) = 36$$

$$2. \lim_{x \rightarrow 9} 9x = \lim_{x \rightarrow 9} f(x) = 81$$

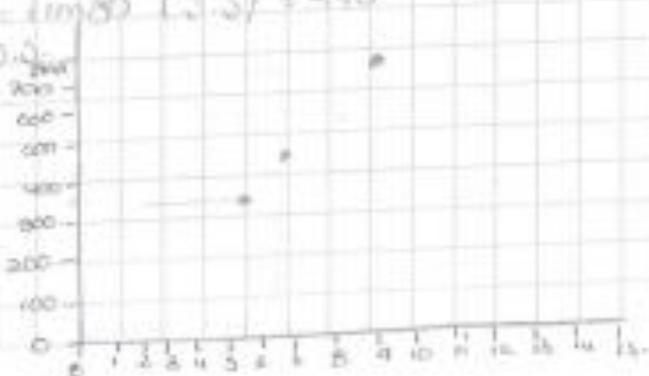
$$3. \lim_{x \rightarrow 5.5} 5.5x \quad 5.5 \lim_{x \rightarrow 5.5} x = \lim_{x \rightarrow 5.5} 5.5(x) = 30.25$$



$$1. \lim_{x \rightarrow 6} 6x = 6 \lim_{x \rightarrow 6} x = \lim_{x \rightarrow 6} f(x) = 36$$

$$2. \lim_{x \rightarrow 9} 9x = 9 \lim_{x \rightarrow 9} x = \lim_{x \rightarrow 9} f(x) = 81$$

$$3. \lim_{x \rightarrow 5.5} 5.5x = 5.5 \lim_{x \rightarrow 5.5} x = \lim_{x \rightarrow 5.5} f(x) = 30.25$$



$$\lim_{x \rightarrow 6} 80x = \lim_{x \rightarrow 6} 80(6) = 480$$

$$6 - 100 = \frac{83.3}{5} \neq$$

480	2
240	2
120	2
60	2
30	2
15	3
5	3
1	

$$\lim_{x \rightarrow 9} 80x = \lim_{x \rightarrow 9} 80(9) = 720$$

$$9 - 100 = \frac{44.4}{4} \neq$$

720	2
360	2
180	2
90	2
45	2
15	3
5	3
1	

$$\lim_{x \rightarrow 5.5} 80x = \lim_{x \rightarrow 5.5} 80(5.5) = 440$$

$$5.5 - 100 = \frac{54.54}{5} \neq$$

440	2
220	2
110	2
55	2
11	11
1	