



Universidad del sureste

Campus Comitán

Licenciatura en Medicina Humana

Tema: Poniendo límites

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Grupo: “B”

Grado: Segundo semestre

Materia: Biomatemáticas

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Margine Morales Irecta**

Comitán de Domínguez Chiapas a 20 de febrero del 2022

Las matemáticas y la biología

• Biomatemáticas •

Uso de herramientas de las matemáticas para el análisis de ecuaciones y temas de la biología

• Límites en matemáticas •

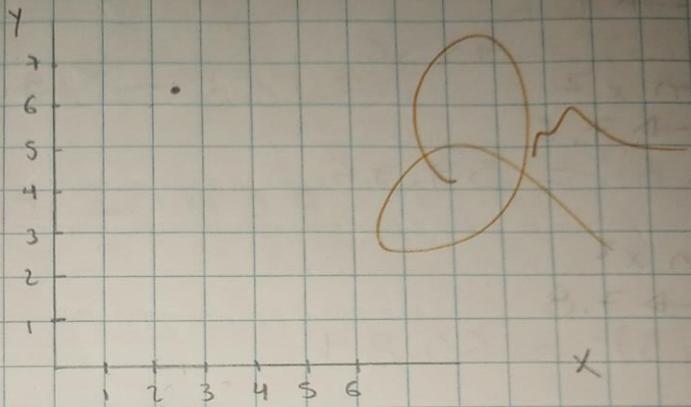
$$\lim_{x \rightarrow a} f(x) = L$$

- Ejercicios -

10-02-2022

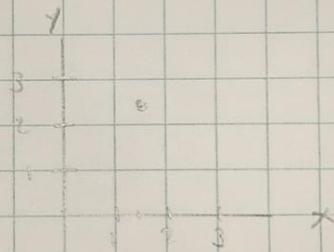
1. $\lim_{x \rightarrow 2.5} x^2$

$\lim 2.5^2 \rightarrow 6.25$

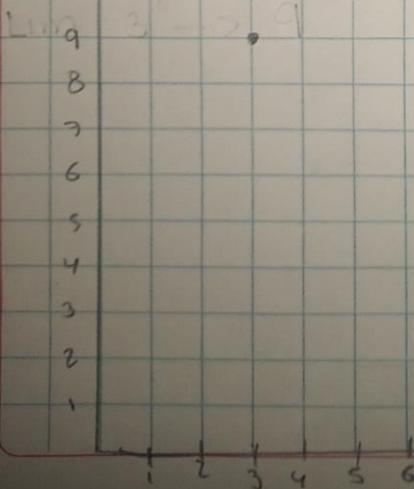


2. $\lim_{x \rightarrow 1.5} x^2$

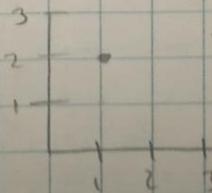
$\lim 1.5^2 \rightarrow 2.25$



3. $\lim_{x \rightarrow 3} x^2$ $\lim 3^3 \rightarrow 9$



4. $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = \frac{(x-1)(x+1)}{x-1}$



$x+1$
 $1+1$
2

11-02-22

11-02-22

1) $\lim x^2$

$x \rightarrow 6.6$

$(6.6)^2 = 43.56$

2) $\lim x^2$

$x \rightarrow 7.6$

$(7.6)^2 = 57.76$

3) $\lim x^2$

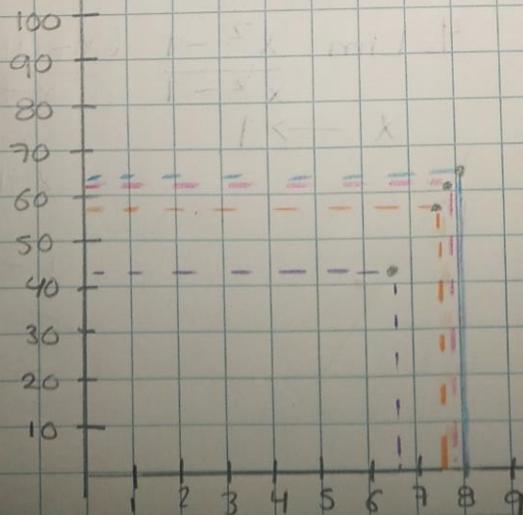
$x \rightarrow 7.8$

$(7.8)^2 = 60.84$

4) $\lim x^2$

$x \rightarrow 8$

$(8)^2 = 64$



11-02-2022

$$\lim_{x \rightarrow PH} x^3$$

$$\lim (7.8)^3 = 438.976$$

$$\lim_{x \rightarrow PH} x^3$$

$$\lim (7.8)^3 = 474.552$$

$$\lim_{x \rightarrow PH} x^4$$

$$\lim (8)^4 = 4096$$

5000

4000

3000

2000

1000

800

600

400

200

1

2

3

4

5

6

7

8

-Tarea-

16-02-2022

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

$$x \rightarrow 2$$

$$\frac{4 + 2 - 6}{2 - 2} = \frac{0}{0}$$

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

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

$$x \rightarrow -4$$

$$\frac{16 + 5(-4) + 4}{16 + 3(-4) - 4} = \frac{16 - 20 + 4}{16 - 12 - 4} = \frac{0}{0}$$

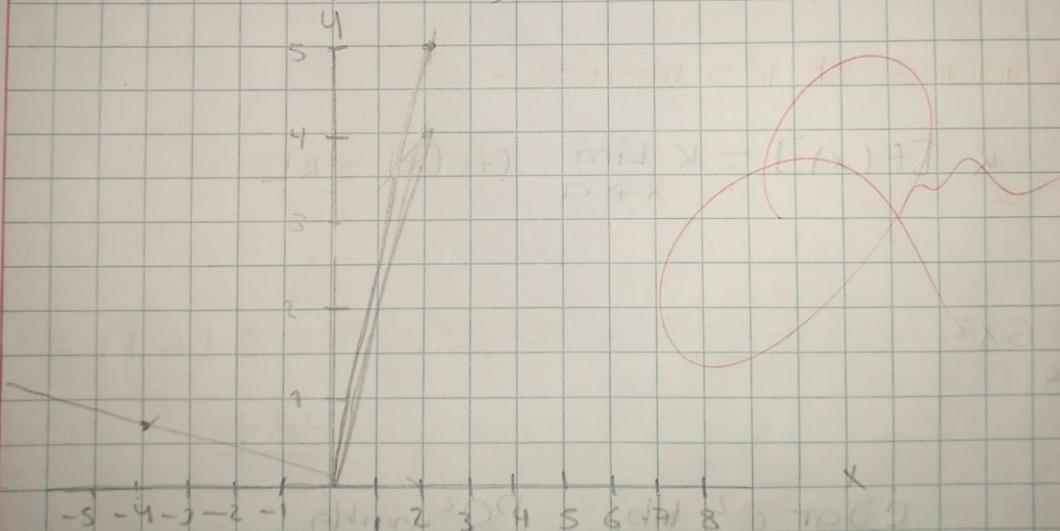
$$\frac{(x+4)(x+1)}{(x+4)(x-1)} = \lim_{x \rightarrow -4} \frac{x+1}{x-1} = \frac{-4+1}{-4-1} = \frac{-3}{-5} = \frac{3}{5}$$

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

$$x \rightarrow 2$$

$$\frac{4 - 4}{2 - 2} = \frac{0}{0}$$

$$\frac{(x-2)(x+2)}{x-2} = \lim_{x \rightarrow 2} x+2 \quad 2+2 = 4$$



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

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

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

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

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

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

$$\lim_{x \rightarrow a} \sqrt[n]{x} = \sqrt[n]{a}$$

$$\lim_{x \rightarrow 4} \sqrt{x} = 2$$

- Propiedades de los límites -

$$\lim_{x \rightarrow a} k [f(x)] = k \lim_{x \rightarrow a} f(x) = kL$$

$$\lim_{x \rightarrow 8} 6x^2$$

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

384

x = k

¿Sat O₂ Hb?

PO₂ mmHg

PH 6

k = 80

PH 9

PH 5.5

$$80(6) = 480$$

-

47.22%

$$80(9) = 720$$

-

4.5%

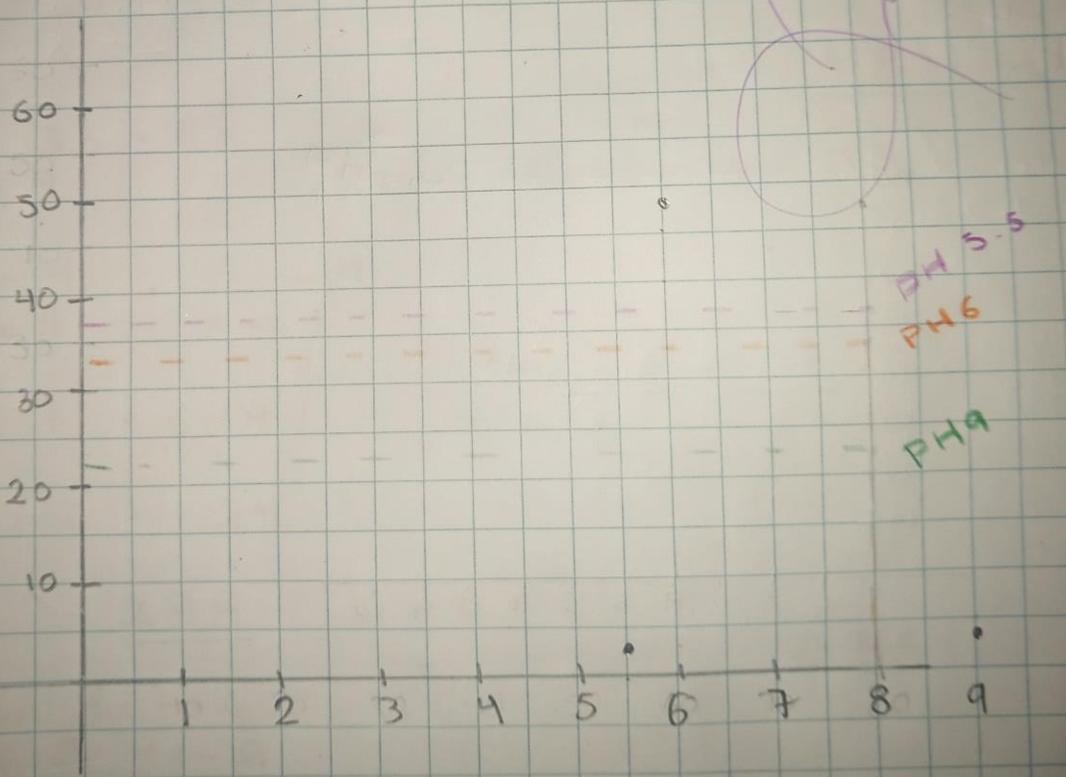
$$80(5.5) = 440$$

-

2.77%

TAREA

480	720	440	2
240	360	220	2
120	180	110	2
60	90	55	5
12	18	11	2
6	9	11	3
2	3	11	3
1	1	1	2
			1

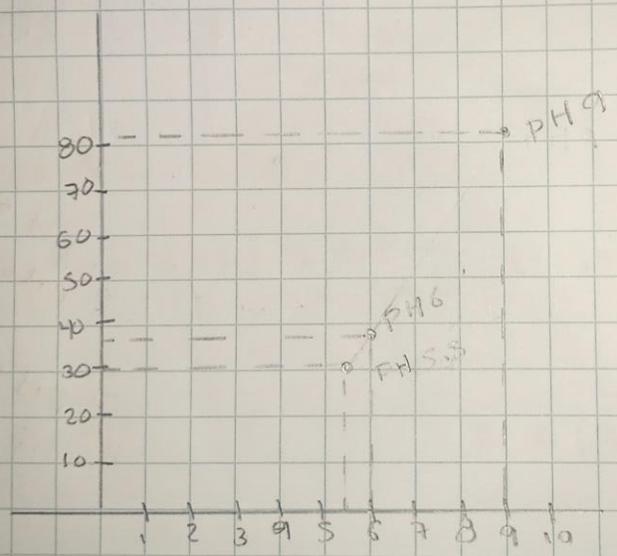


TARDA

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

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

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



18-02-2022

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

$$\lim_{x \rightarrow 2} 3x + \lim_{x \rightarrow 2} 4x$$

$$\lim 3(2) + \lim 4(2) \\ 3(2) + 4(2) \\ 6 + 8 = \underline{14}$$

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

$$4 \lim_{x \rightarrow 2} 2 \cdot 3 \lim_{x \rightarrow 2} 2$$

$$4(2) \cdot (3(2)) \\ 8 \cdot 6 \\ \underline{48}$$

$$3) \lim_{x \rightarrow 4} 3x \cdot 6x$$

$$3 \lim_{x \rightarrow 4} 4 \cdot 6 \lim_{x \rightarrow 4} 4$$

$$3(4) \cdot 6(4) \\ 12 \cdot 24 \\ \underline{288}$$

$$4) \lim_{x \rightarrow 4} \frac{3x}{4x}$$

$$3 \lim_{x \rightarrow 4} 4 \div 4 \lim_{x \rightarrow 4} 4$$

$$3(4) \div 4(4) \\ 12 \div 16 \\ 0.75$$

$$5) \lim_{x \rightarrow 2} \frac{3x - 12}{4x - 19}$$

$$\frac{\lim 3(5) - 12}{\lim 4(5) - 19}$$

$$\frac{\lim 15 - 12}{\lim 20 - 19}$$

$$\frac{3}{1} = \underline{3}$$

2023-10-01

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

$$\lim_{x \rightarrow a} \sqrt[n]{f(x)} = \lim_{x \rightarrow a} \sqrt[n]{a}$$

$$\rightarrow \lim_{x \rightarrow 3} 2x^3 = \lim ((2)(3))^3 = 6^3 = 216$$

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

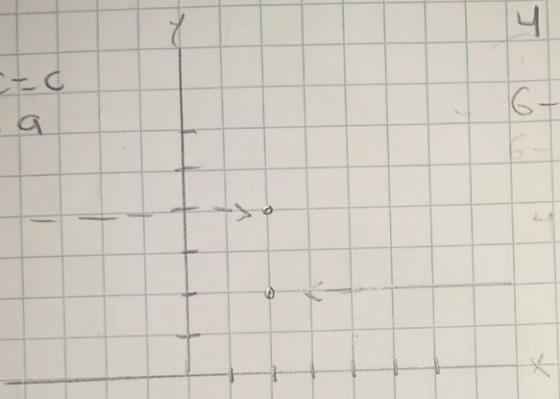
$$2^3 \quad (2x^3)^3$$

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

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

$(2)^2 = 4$
 4
 $6-2(4)$

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



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

$x \rightarrow 1$

$(1)^2 + 1 = 2 \in \mathbb{R}$
 $1 + 1 = 2$
 2

