



Universidad Del Sureste
Campus Comitán
Licenciatura en Medicina Humana

Tema: Poniendo límites.

Materia: Biomatemáticas.

Alumno: Morales Cano Anayancy.

Grado: Segundo semestre.

Grupo: B

Catedrático: Dra. Rosvani Margine Morales Irecta.

FORMULA

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

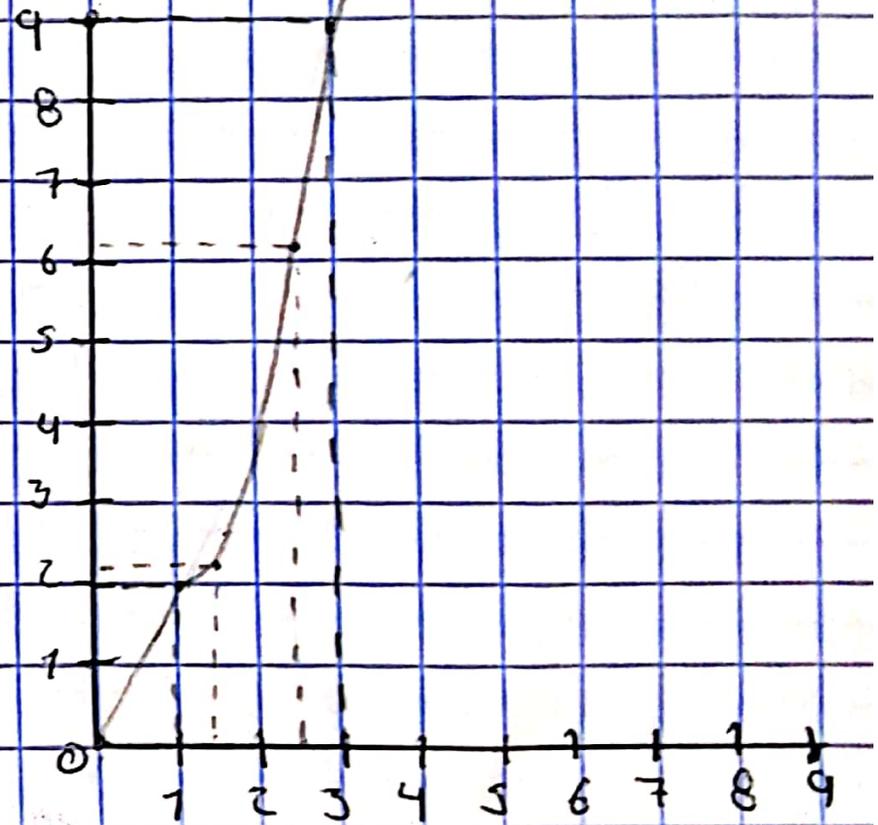
EJERCICIOS

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

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

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

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



— EJERCICIOS —

$$\lim_{x \rightarrow 6.6} x^2$$

$$\lim (6.6)^2 = 43.56$$

$$\lim_{x \rightarrow 7.6} x^2$$

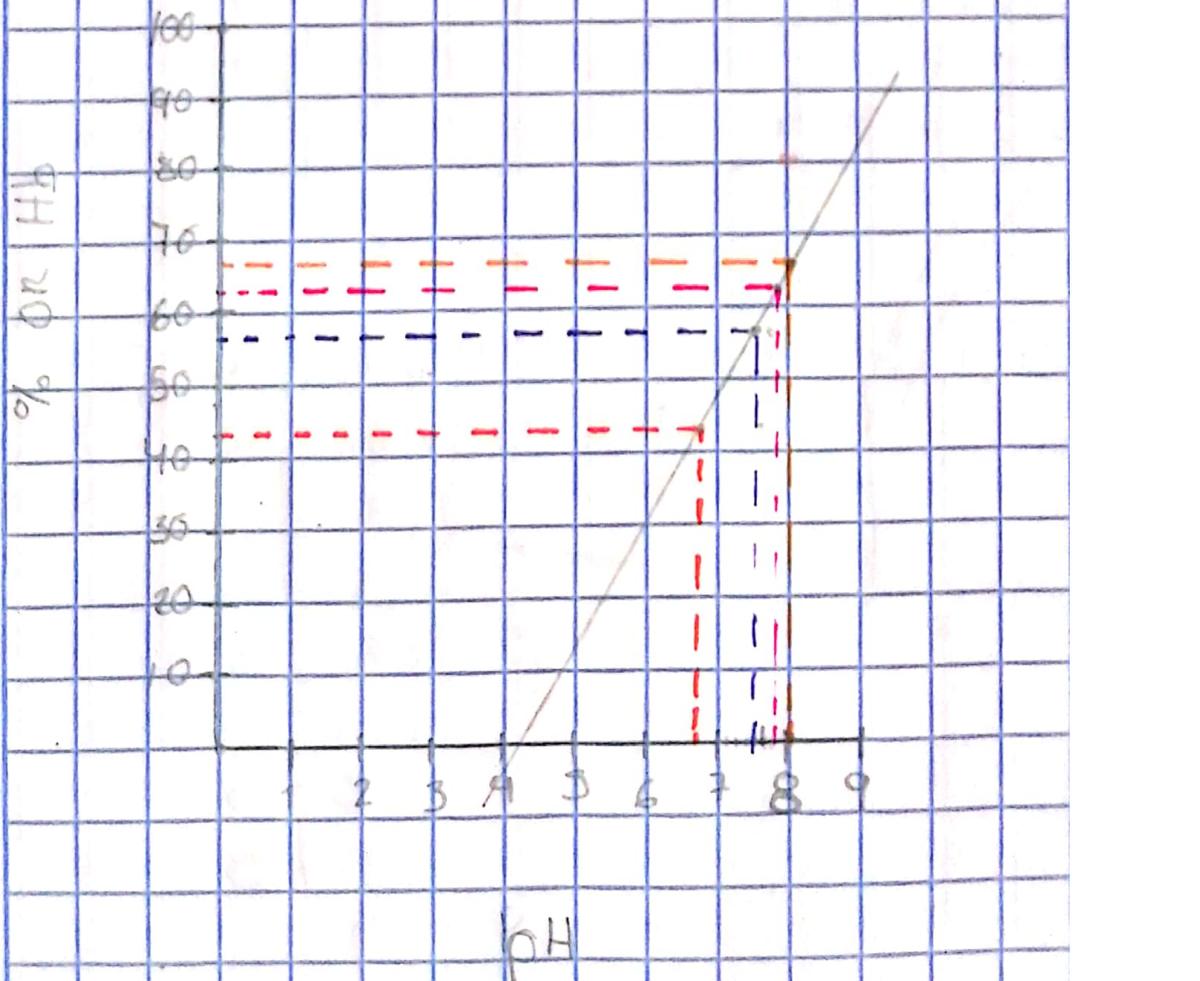
$$\lim (7.6)^2 = 57.76$$

$$\lim_{x \rightarrow 7.8} x^2$$

$$\lim (7.8)^2 = 60.84$$

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

$$\lim (8)^2 = 64$$



EJERCICIOS

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

$$\frac{(2)^2 + (2) - 6}{(2) - 2} = 0$$

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

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

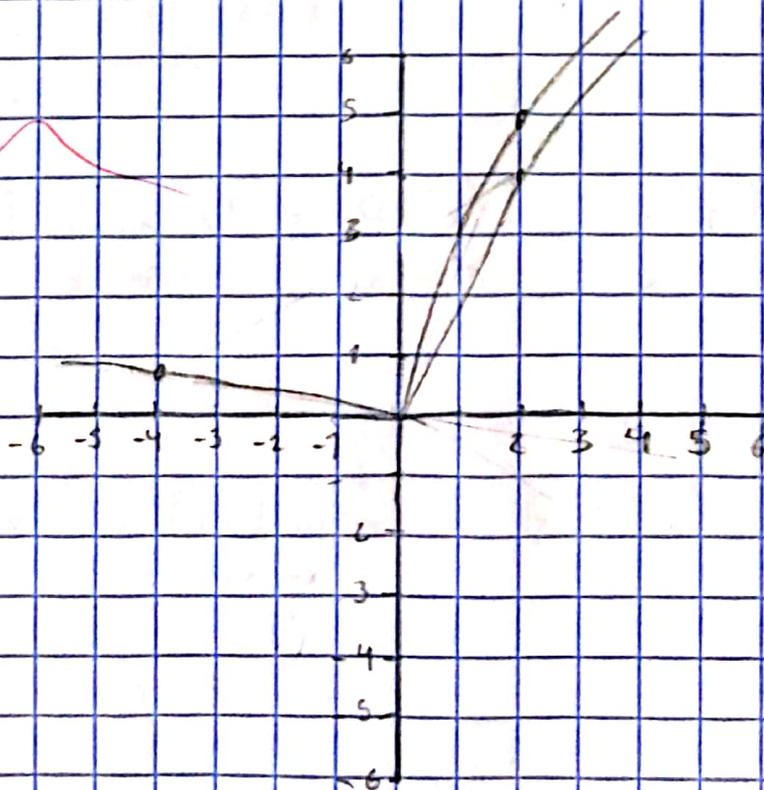
$$\frac{(-4)^2 + 5(-4) + 4}{(-4)^2 + 3(-4) - 4} = \frac{0}{0} = 0$$

$$\frac{\cancel{(x-4)}(x+1)}{\cancel{(x-4)}(x-1)} = \lim_{x \rightarrow -4} \frac{(x+1)}{(x-1)} = \frac{(-4+1)}{(-4-1)} = \frac{-3}{-5} = 0.6$$

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

$$\frac{(2)^2 - 4}{(2) - 2} = \frac{0}{0} = 0$$

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



Propiedades de los límites

4 PRINCIPALES

$$1.- \lim_{x \rightarrow a} C = C$$

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

$$2.- \lim_{x \rightarrow a} x = a$$

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

$$3.- \lim_{x \rightarrow a} x^n = a^n$$

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

$$4.- \lim_{x \rightarrow a} \sqrt[n]{x} = \sqrt[n]{a}$$

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

$$1.- \lim_{x \rightarrow a} K [f(x)] = K \lim_{x \rightarrow a} f(x) = KL$$

$$\lim_{x \rightarrow 3} 9(x^2)$$

$$9 \lim_{x \rightarrow 3} x^2 = 9(x^2) = 9(3^2) = 9(9) = 81$$

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

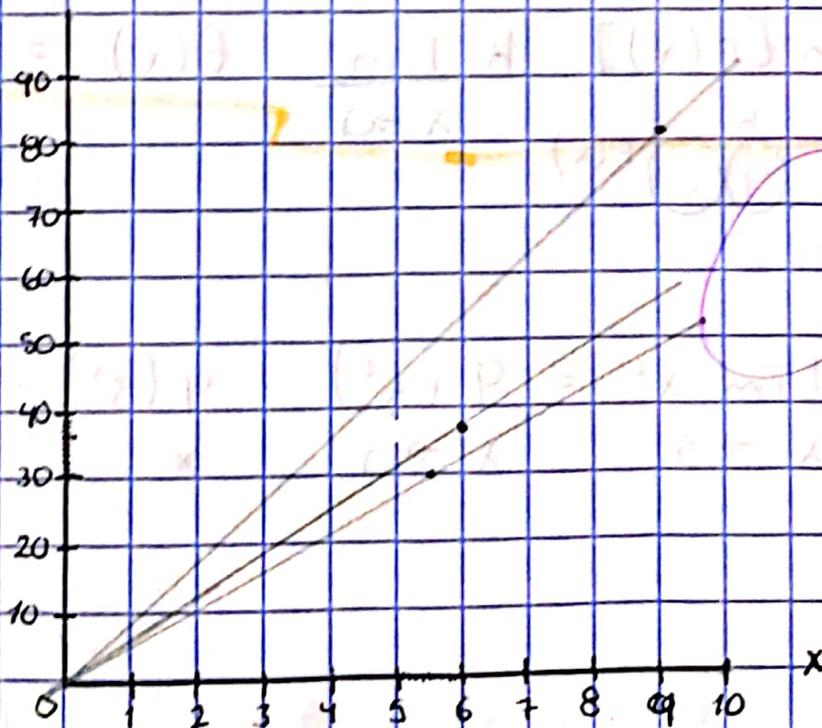
Exercícios

¿ Sat O₂ Hb?

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

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

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



pO_2 mm Hg

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

47.22%

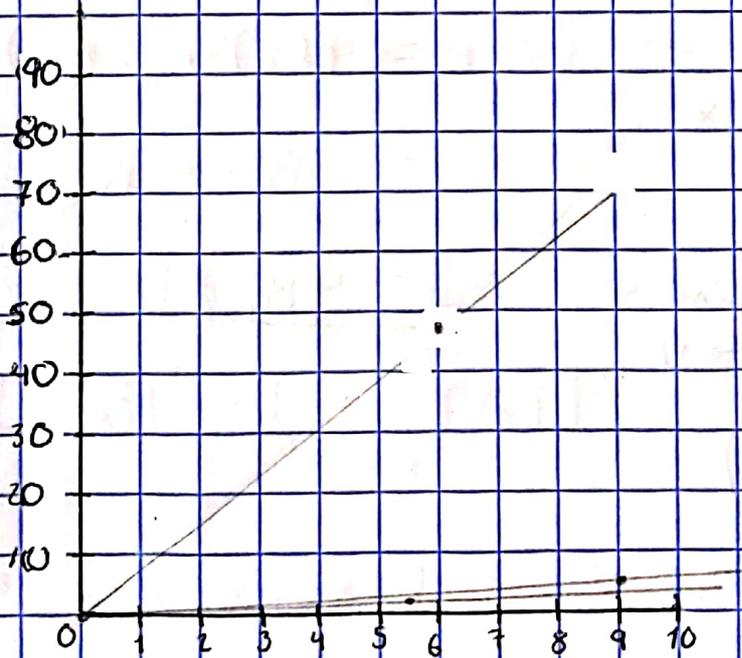
2. $\lim_{x \rightarrow 9} 80x = 80 \lim_{x \rightarrow 9} x = \lim_{x \rightarrow 9} 80(9) = 720$

4.5%

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

2.77%

15,840 → 100%
440 →



480	720	440	2
240	360	220	2
120	180	110	2
60	90	55	5
12	18	11	2
6	9	11	3
3	4.5	5.5	5

→ 15,840 100%
440

$$2.- \lim_{x \rightarrow a} f(x) \pm g(x) = \lim_{x \rightarrow a} f(x) \pm \lim_{x \rightarrow a} g(x) = L \pm m$$

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

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

$$\lim 3(z) + \lim 4(z) \\ \lim 6 + \lim 8 = \boxed{14}$$

$$3.- \lim_{x \rightarrow a} f(x) \cdot g(x) = \lim_{x \rightarrow a} f(x) \cdot \lim_{x \rightarrow a} g(x) = L \cdot m$$

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

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

$$= 4(2) \cdot 3(2)$$

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

$$= 8 \cdot 6$$

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

$$= \boxed{48}$$

$$= 3(4) \cdot 6(4)$$

$$= 12 \cdot 24$$

$$= \boxed{288}$$

$$4.- \lim_{x \rightarrow a} f(x) \div g(x) = \lim_{x \rightarrow a} f(x) \div \lim_{x \rightarrow a} g(x) = L \div M, M \neq 0$$

$$\lim_{x \rightarrow 4} \frac{3x}{4x} = \lim_{x \rightarrow 4} 3(x) \div \lim_{x \rightarrow 4} 4(x)$$

$$= 3(4) \div 4(4)$$

$$= 12 \div 16$$

$$= 0.75$$

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

$$\lim_{x \rightarrow 5} 3(x) - 12 \div \lim_{x \rightarrow 5} 4(x) - 19$$

$$15 - 12 \div 20 - 19$$

$$3 \div 1 = \boxed{3}$$

$$5.- \lim_{x \rightarrow a} [f(x)]^n = [\lim_{x \rightarrow a} f(x)]^n$$

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

$$\lim_{x \rightarrow 3} 2x^3 = [\lim_{x \rightarrow 3} f(x)]^n$$

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

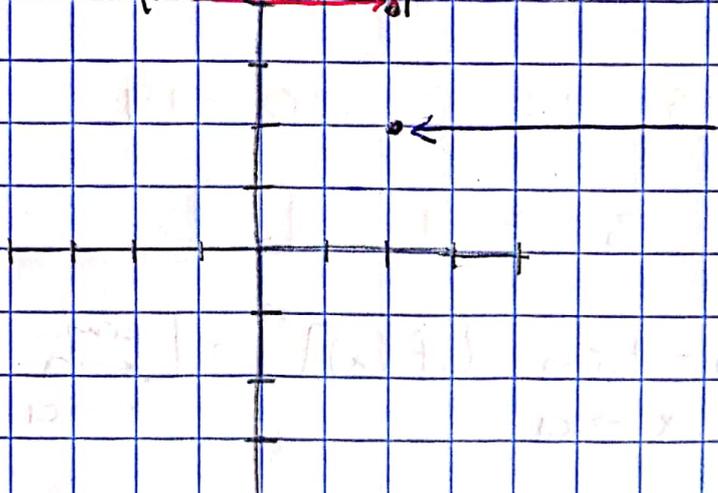
$$\lim_{x \rightarrow 2} \sqrt[3]{4(x)} = \lim_{x \rightarrow 2} \sqrt[3]{4(2)} = \sqrt[3]{8} = 2$$

Limites Laterales

- Cuando x se acerca a C por la derecha.

$$\lim_{x \rightarrow a^+} f(x) \quad \text{ó} \quad \lim_{x \rightarrow 0^+} |x|$$

- Cuando x se acerca a C por la izquierda.



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

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

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

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

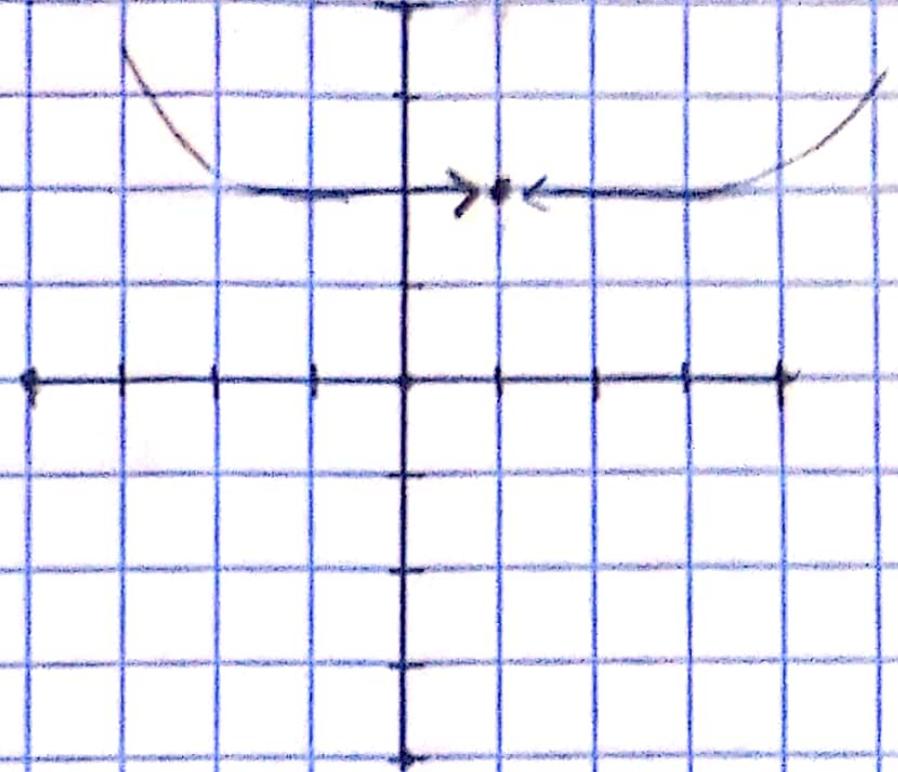
$$\rightarrow \lim_{x \rightarrow 2} 6 - 2x = 6 - 2(2) = 6 - 4 = 2$$

2

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

$$x \rightarrow 1$$

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



$$\textcircled{1}: \lim_{x \rightarrow 1} x^2 + 1 = (1)^2 + 1$$
$$1 + 1 = \boxed{2}$$

$$\textcircled{2}: \lim_{x \rightarrow 1} 2(x) = 2(1) = 2$$