1. Calcular los límites

1. $$\lim_{h\to 0} \frac{(3+h)^{-1} - 3^{-1}}{h} = -1/9$$

$\Downarrow$ $\frac{0}{0}$ Indeterminación

$$\lim_{h\to 0} \frac{\frac{1}{(3+h)} - \frac{1}{3}}{h}$$

$$\lim_{h\to 0} \frac{\frac{3-(3+h)}{3(3+h)}}{h}$$

$$\lim_{h\to 0} \frac{\frac{3-3-h}{9+h}}{h}$$

$$\lim_{h\to 0} \frac{-\frac{h}{9+h}}{\frac{h}{1}}$$

$$\lim_{h\to 0} -\frac{\cancel{h}}{\cancel{h}(9+h)}$$

$$\lim_{h\to 0} -\frac{1}{9+h} = -\frac{1}{9}$$

2. $$\lim_{t\to 0} \left(\frac{1}{t} - \frac{1}{t^2+t}\right) = 1$$

$$\lim_{t\to 0} \frac{t^2+t-t}{t(t^2+t)}$$

$$\lim_{t\to 0} \frac{t^{\cancel{2}}}{\cancel{t}(t^2+t)}$$

$$\lim_{t\to 0} \frac{t}{t^2+t}$$

$$\lim_{t\to 0} \frac{\cancel{t}}{\cancel{t}(t+1)}$$

$$\lim_{t\to 0} \frac{1}{t+1} = 1$$

3. $$\lim_{x\to 0} \frac{\sqrt{x+2} - \sqrt{2}}{x}$$

Racionalizar

$$\lim_{x\to 0} \frac{\sqrt{x+2} - \sqrt{2}}{x} \cdot \frac{\sqrt{x+2} + \sqrt{2}}{\sqrt{x+2} + \sqrt{2}}$$

$$\lim_{x\to 0} \frac{(\sqrt{x+2})^2 - (\sqrt{2})^2}{x(\sqrt{x+2} + \sqrt{2})}$$

$$\lim_{x\to 0} \frac{x+2-2}{x(\sqrt{x+2} + \sqrt{2})}$$

$$\lim_{x\to 0} \frac{\cancel{x}}{\cancel{x}(\sqrt{x+2} + \sqrt{2})}$$

$$\lim_{x\to 0} \frac{1}{\sqrt{x+2} + \sqrt{2}} = \frac{1}{\sqrt{0+2} + \sqrt{2}} = \frac{1}{\sqrt{2} + \sqrt{2}} = \frac{1}{2\sqrt{2}}$$

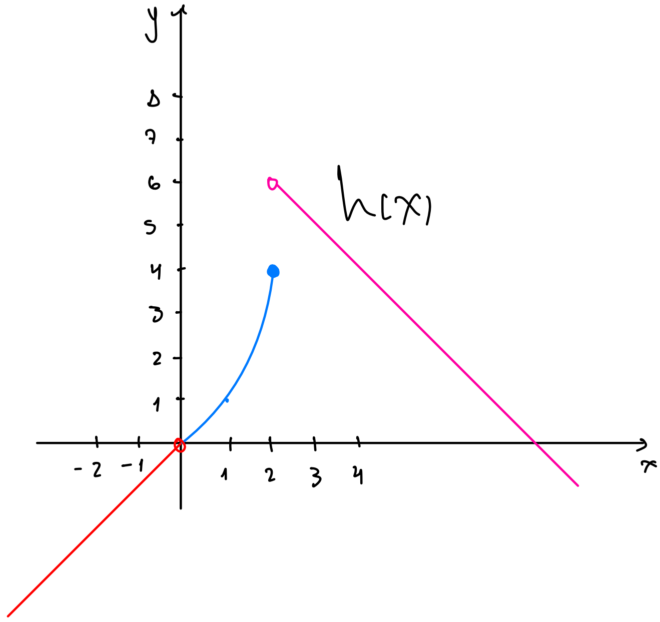
2. Método grafico.

a. $f(-2) = -2$ b. $\lim_{x \to -2} f(x) = -\infty$ c. $f(0) = 5$ d. $\lim_{x \to 0^-} f(x) = 0$ $\lim_{x \to 0^+} f(x) = 5$

f. $\lim_{x \to 0} f(x) = \nexists$ g. $\lim_{x \to -4} f(x) = 2$ h. $\lim_{x \to -2} f(x) = -\infty$

3.

$$h(x) = \begin{cases} x & , \quad x < 0 \\ x^2 & , \quad 0 < x \leq 2 \\ 8 - x & \quad x > 2 \end{cases}$$



a.

i $\lim_{x \to 0^+} h(x) = 0$

ii $\lim_{x \to 0} h(x) = 0$

iii $\lim_{x \to 1} h(x) = 1$

iv. $\lim_{x \to 2^-} h(x) = 4$

v. $\lim_{x \to 2^+} h(x) = 6$

vi. $\lim_{x \to 2} h(x) = \nexists$