COMANDO GENERAL DEL EJÉRCITO
ESCUELA MILITAR DE INGENIERÍA
"MCAL. ANTONIO JOSÉ DE SUCRE
BOLIVIA

PRÁCTICA

"GRAFICA DE LIMITE4S

DOCENTE **: Ing. IROBERTO VALDEZ FERNANDEZ**

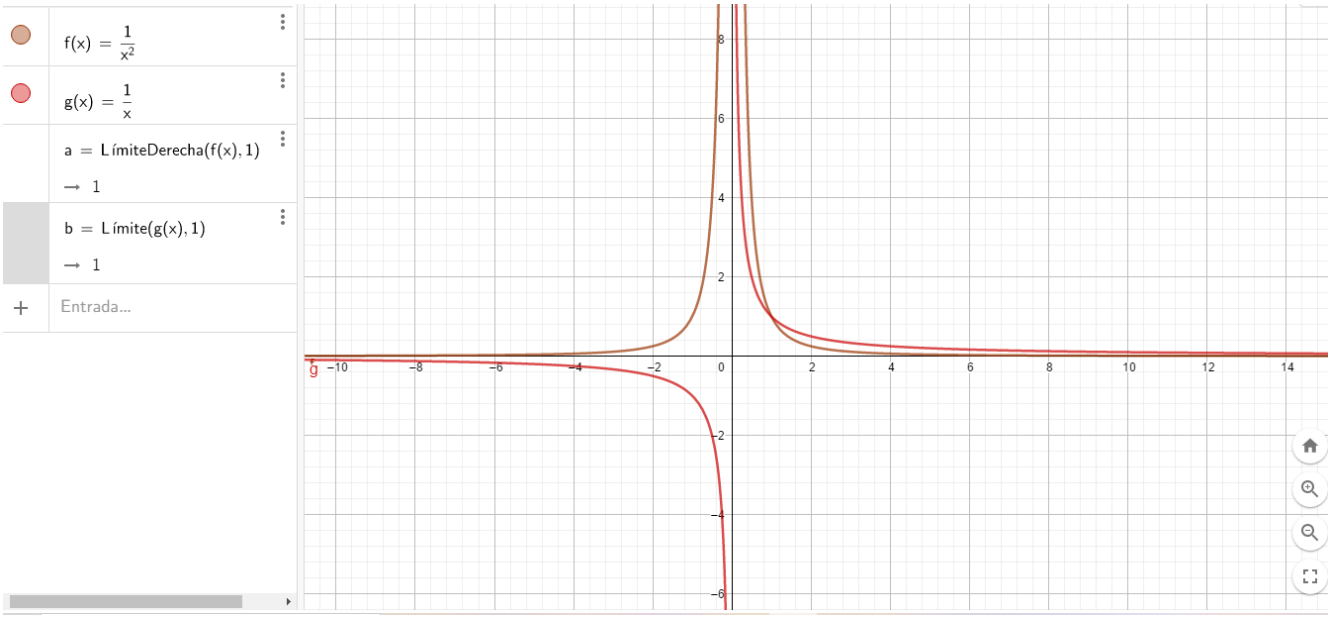
CARRERA **: INGENIERÍA DE SISTEMAS**

ASIGNATURA **: VARIABLE COMPLEJA**

SEMESTRE **: TERCERO**

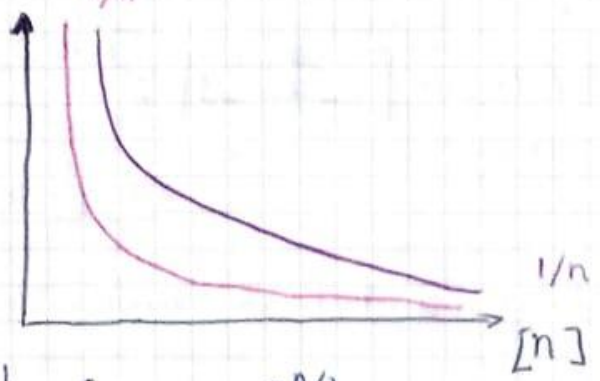
U. ACADÉMICA ***: ESCUELA MILITAR***

GESTIÓN ***: II/2022***


f(x) = 1/x²
g(x) = 1/x
a = LímiteDerecha(f(x), 1)
→ 1
b = Límite(g(x), 1)
→ 1
Entrada...
f
g
−10
−8
−6
−4
−2
0
2
4
6
8
10
12
14
8
6
4
2
−2
−4
−6

$$\left(1 + \frac{x^2+y^2}{n^2} + \frac{2x}{n}\right)^{n/2} = r_n$$

$$r_0 = \lim_{n\to\infty} r_n = \lim_{n\to\infty} \left[\left(1 + \frac{x^2+y^2}{n^2} + \frac{2x}{n}\right)^{n/2}\right]$$



- n está variando

$$r_{n_0} = \lim \left[\left(1 + \frac{2x}{n}\right)\right]^{n/2} = e^x$$

$$r_0 = e^x$$

$$\theta_0 = \lim_{n\to\infty} \theta_n \qquad \theta_n = \text{Arg}\,(z_n)$$

$\text{Arg}\,(z_1 z_2) = \text{arg}\,(z_1) + \text{arg}\,(z_2)$! Propiedad de Argumento
$\text{Arg}\,(z_1^n) = n\,\text{arg}\,(z)$

$$\theta_n = \text{arg}\left(\left(1 + \frac{x}{n}\right) + i\left(\frac{y}{n}\right)^n\right) = n\,\text{arg}\left(1 + \frac{x}{n} + i\frac{y}{n}\right)$$

$$= n \arctg\left(\frac{y/n}{1 + \frac{x}{n}}\right)$$

$$= n \arctg\left(\frac{y}{n+x}\right)$$

$$\alpha_0 = \lim\left[n \arctg\left(\frac{y}{n+x}\right)\right]$$

$$u = \arctg\left(\frac{y}{n+x}\right) \rightarrow \tg u \left(\frac{y}{n+x}\right)$$

$$(n+x)\cdot \tg u = y$$

Graficar

$$\lim_{n\to\infty}\left(1+\frac{z}{n}\right)^n = e^z$$

$$n+x = \frac{y}{\tan u}$$

$$n = \left(\frac{y}{\tan u} - x\right)$$

$$e_0 = \lim_{u\to 0}\left(\frac{yu}{\frac{\operatorname{sen} u}{\cos u}} - xu\right)$$

$$= \lim_{u\to 0}\left(\frac{\cos u}{\frac{\operatorname{sen} u}{u}}\, y - xu\right)$$

$$\alpha_0 = \frac{\cos 0}{1}\, y - x\cdot 0 = y = e_0$$

$$\lim_{n\to\infty} z_n = e^x e^{iy}$$

$$= e^z \quad \therefore \text{ Si cumple}$$