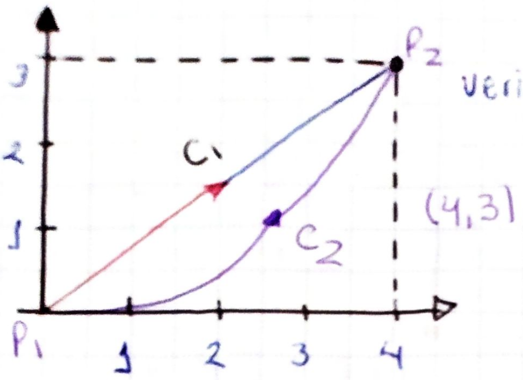

Se tiene una fuerza $F = (2y^2x\hat{i} + 2x^2y\hat{j})N$ verifique si la fuerza es o no conservativa

$C_1 \Rightarrow$ Recta $\boxed{(Y = A + Bx)}$

$C_2 \Rightarrow$ Parabola $\boxed{(y = ax^b)}$

$b = 2$

$$\begin{cases} F_x = 2y^2x \\ F_y = 2x^2y \end{cases}$$

Ecuacion Recta que pasa por dos puntos

Pendiente

$$\boxed{B = \frac{\Delta y}{\Delta x}} \quad B = \frac{y_F - y_i}{x_F - x_i} = \frac{3-0}{4-0} = \frac{3}{4} \quad \boxed{y = 0 + \frac{3}{4}x}$$

ojo

$$W = \int F_x\,dx + \int F_y\,dy + \int \cancel{F_z}^{0}\,dz \qquad \boxed{y = \frac{3}{4}x} \quad \boxed{x = \frac{4}{3}y}$$

$$W_{C_1} = \int 2y^2x\,dx + \int 2x^2y\,dy$$

$$W_{C_1} = 2\int \left(\frac{3x}{4}\right)^2 x\,dx + 2\int \left(\frac{4}{3}y\right)^2 y\,dy$$

$$W_{C_1} = \cancel{2}^{1} \cdot \frac{9}{\cancel{16}_{8}} \int_0^4 x^3\,dx + 2 \cdot \frac{16}{9}\int_0^3 y^3\,dy$$

$$W_{C_1} = \frac{9}{8}\left[\frac{x^4}{4}\right] + \frac{32}{9}\left[\frac{y^4}{4}\right]_0^3 = \frac{9}{8}\cdot\frac{1}{4}(4^4 - 0^4) + \frac{\cancel{32}^{\cancel{16}\,8}}{9}\cdot\frac{1}{\cancel{4}_{\cancel{2}\,1}}(3^4 - 0^4)$$

$$\Rightarrow \frac{9}{32}(256) + \frac{8}{9}(81) \qquad W = 72 + 72 \rightarrow \boxed{W = 144\ J}$$

$$Y = \frac{3}{4}x$$

$$Y = F(x) \Rightarrow \frac{dy}{dx} = \frac{d\left(\frac{3}{4}x\right)}{dx} = \frac{3}{4}\frac{\cancel{dx}^{1}}{\cancel{dx}} \rightarrow \underbrace{\frac{dy}{dx} = \frac{3}{4}}_{\text{Pendiente}}$$

$$\boxed{\frac{dy}{dx} = \frac{3}{4}}$$

$$WC_2 = 2\int y^2 x\,dx + 2\int x^2 y\,dy \qquad y = \frac{3}{4}x \,;\, dy = \frac{3}{4}dx$$

$$WC_2 = 2\int \left(\frac{3}{4}x\right)^2 x\,dx + 2\int x^2 \cdot \frac{3}{4}dx \,,\, \frac{3}{4}x$$

$$WC_2 = \cancel{2}^{1} \cdot \frac{9}{\cancel{16}_{8}} \int x^3 dx + \cancel{2}^{1} \cdot \frac{9}{\cancel{16}_{8}} \int x^3 dx$$

$$W_{C2} = \frac{9}{8}\int x^3 dx + \frac{9}{8}\int x^3 dx = \frac{\cancel{18}^{9}}{\cancel{16}_{8}} \int x^3 dx = \frac{9}{4}\int_0^4 x^3 dx$$

$$W_{C2} = \frac{9}{4}\left[\frac{x^4}{4}\right]_0^4 = \frac{9}{16}\left(4^4 - 0^4\right) = 144 \rightarrow \boxed{144\,J}$$