

Plano: Equação do movimento costeira júnior

$$3x^2 + 3y^2 - 2xy - 10x - 10y + 7 = 0$$

$$\begin{cases} x = (x_1 - y_1) \frac{\sqrt{3}}{2} \\ y = (x_1 + y_1) \frac{\sqrt{3}}{2} \end{cases}$$

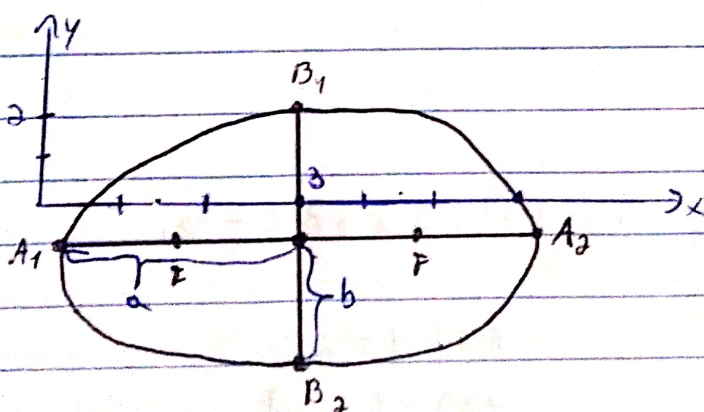
$$3 \left[(x_1 - y_1) \frac{\sqrt{3}}{2} \right]^2 + 3 \left[(x_1 + y_1) \frac{\sqrt{3}}{2} \right]^2 - 2 (x_1 - y_1) \frac{\sqrt{3}}{2} (x_1 + y_1) \frac{\sqrt{3}}{2} - 10 \left[(x_1 - y_1) \frac{\sqrt{3}}{2} \right] - 10 \left[(x_1 + y_1) \frac{\sqrt{3}}{2} \right] + 7 = 0$$

$$3 \frac{3}{4} (x_1^2 - 2x_1y_1 + y_1^2) + 3 \frac{3}{4} (x_1^2 + 2x_1y_1 + y_1^2) - 10 (x_1 - y_1) - 10 (x_1 + y_1) + 7 - \sqrt{3} = 0$$

a) ela se refere a uma elipse.

b) o seu centro é $\left(\frac{5}{\sqrt{3}}, 0 \right)$, semi maior $a = 3$, semi menor $b = \frac{3}{\sqrt{3}}$, focos em $\frac{3\sqrt{3}}{2}$ e $-\frac{3\sqrt{3}}{2}$

c)



2) $U = (1, -1, 2)$, $V = (2, 0, 1)$ e $W = (0, -1, -2)$,

a) $\|U \times V\| = A$

$$U \times V = \begin{vmatrix} i & j & k \\ 1 & -1 & 2 \\ 2 & 0 & 1 \end{vmatrix} = \begin{vmatrix} i & j \\ 1 & -1 \\ 2 & 0 \end{vmatrix} = (-1, 2, 3)$$

$$2) \|U \times V\| = A$$

$$A = \sqrt{1+4+9}$$

$$A = \sqrt{14}$$

$$b) (U \times V) \cdot W = V$$

$$\begin{vmatrix} 1 & -1 & 2 \\ 2 & 0 & 1 \\ 0 & -1 & -2 \end{vmatrix} \begin{vmatrix} 1 & -1 \\ 2 & 0 \\ 0 & -1 \end{vmatrix} = |-1| = 1$$

$$V = 1$$

$$3) (x-2)^2 + (y-1)^2 + (z+1)^2 = 4, A = (9, -2, 2)$$

$$O(2, 1, -1)$$

$$R = 2$$

$$n: \begin{cases} x = 4 - 2t \\ y = -2 + 3t \\ z = 2 - 3t \end{cases}$$

$$\vec{AO} = (-2, 3, -3)$$

$$4) \alpha: x - y + 2z = 5 \quad \beta: 2x + z = -5,$$

$$2) U = (1, -1, 2)$$

$$V = (2, 0, 1)$$

$$x \Rightarrow 1 = 2t_0$$

$$y \Rightarrow -1 = 0t_0$$

$$z \Rightarrow 2 = 1t_0$$

Logo $U \neq \pm V$, então eles não são concorrentes.

$$\begin{aligned} x - y + 2z &= 5 \quad \neq \quad -2x + 2y - 4z = -10 \quad = \quad 2y - 3z = -15 \\ 2x + 0 + z &= -5 \quad 2x + 0 + z = -5 \end{aligned}$$

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b)

$$2y - 3z = -15$$

$$2y = 3z - 15$$

$$y = \frac{3z - 15}{2}$$

$$x - \left(\frac{3z - 15}{2} \right) + 2z = -5$$

$$x = \frac{-25 + 15z}{2}$$

$$n: \begin{cases} x = \frac{-25}{2} + \frac{15z}{2} \\ y = \frac{-15}{2} + \frac{3z}{2} \\ z = z \end{cases}$$

$$A\left(\frac{-25}{2}, \frac{-15}{2}, 0\right).$$

$$v = \left(\frac{1}{2}, \frac{3}{2}, 1\right).$$