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Aluno: Edilson do nascimento costa júnior

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

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

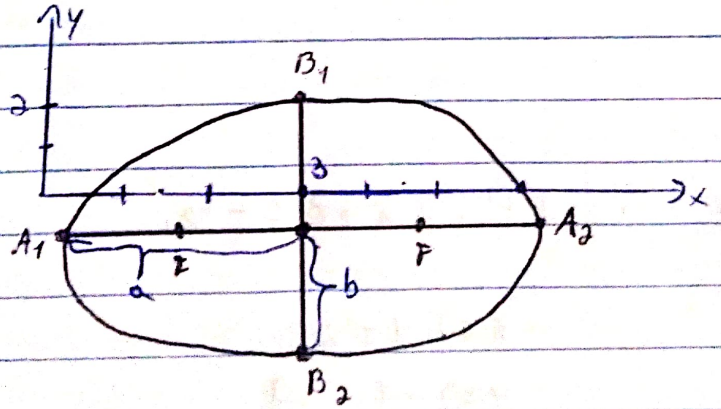
$$3\left[(x_1 - y_1)\frac{\sqrt{2}}{2}\right]^2 + 3\left[(x_1 - y_1)\frac{\sqrt{2}}{2}\right]^2 - 2(x_1 - y_1)\frac{\sqrt{2}}{2}(x_1 + y_1)\frac{\sqrt{2}}{2} - 10\left[(x_1 - y_1)\frac{\sqrt{2}}{2}\right] + 10(x_1 - y_1)\frac{\sqrt{2}}{2} + 7 = 0$$

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

a) ela se refere a uma elipse.

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

c)



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

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

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

a) $\|u \times v\| = A$

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

$A = \sqrt{14}$

b) $(u \times v) \cdot w = V$

$$\begin{vmatrix} 1 & -1 & 2 \\ 2 & 0 & 1 \\ 0 & -1 & -2 \end{vmatrix} \begin{matrix} 1 & -1 \\ 2 & 0 \\ 0 & -1 \end{matrix} = |-7| = 7$$

$-4 + 1 - 4$

$V = 7$

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

$O(2, 1, -1)$

$R = 2$

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

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

d) $\alpha: x - y + 2z = 5$ e $\beta: 2x + z = -5$,

a) $u = (1, -1, 2)$

$v = (2, 0, 1)$

$x \Rightarrow 1 = 2t_0$

$y \Rightarrow -1 = 0t_0$

$z \Rightarrow 2 = 1t_0$

Logo $u \neq tv$, então elas não concorrentes.

$$x - y + 2z = 5 \quad (-2) \quad -2x + 2y - 4z = -10$$

$$2x + 0 + z = -5 \quad 2x + 0 + z = -5$$

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

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b)

$2y - 3z = -15$

$2y = 3z - 15$

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

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

$x = \frac{-25 + 1z}{2}$

$x' \begin{cases} x = -\frac{25}{2} + \frac{1}{2}z \\ y = -\frac{15}{2} + \frac{3}{2}z \\ z = z \end{cases}$

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

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