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Geometría II

Encontrar el centro de la cónica:
$-2x^2 - 11y^2 - 14xy + 10x + 8y - 9 = 0$

$P = P_0 + \tilde{P}$

$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} x_0 \\ y_0 \end{pmatrix} + \begin{pmatrix} \tilde{x} \\ \tilde{y} \end{pmatrix}$

$x = x_0 + \tilde{x}$
$y = y_0 + \tilde{y}$

Sustituimos $(x_0, y_0) = P_0$

$= -2(\tilde{x} + x_0)^2 - 11(\tilde{y} + y_0)^2 - 14(\tilde{x} + x_0)(\tilde{y} + y_0) + 10(\tilde{x} + x_0) + 8(\tilde{y} + y_0) - 9 = 0$

$= -2\tilde{x}^2 - 4\tilde{x}x_0 - 2x_0^2 - 11\tilde{y}^2 - 22\tilde{y}y_0 - 11y_0^2 - 14\tilde{x}\tilde{y} - 14\tilde{x}y_0 - 14x_0\tilde{y} - 14x_0y_0$
$+ 10\tilde{x} + 10x_0 + 8\tilde{y} + 8y_0 - 9$

$= -2\tilde{x}^2 - 14\tilde{x}\tilde{y} - 11\tilde{y}^2 + \tilde{x}[-4x_0 - 14y_0 + 10] + \tilde{y}[-22y_0 - 14x_0 + 8]$ (#)
$- 2x_0^2 - 11y_0^2 - 14x_0y_0 + 10x_0 + 8y_0 - 9$

igualando a cero, porque la cónica transformada carece de términos lineales

$-4x_0 - 14y_0 + 10 = 0$ — ① $(-14) \Rightarrow$ $56x_0 + 196y_0 - 140 = 0$
$-14x_0 - 22y_0 + 8 = 0$ — ② (4) $\quad -56x_0 - 88y_0 + 32 = 0$

$108y_0 - 108 = 0$
$108y_0 = 108$
$y_0 = 108/108$
$y_0 = 1$

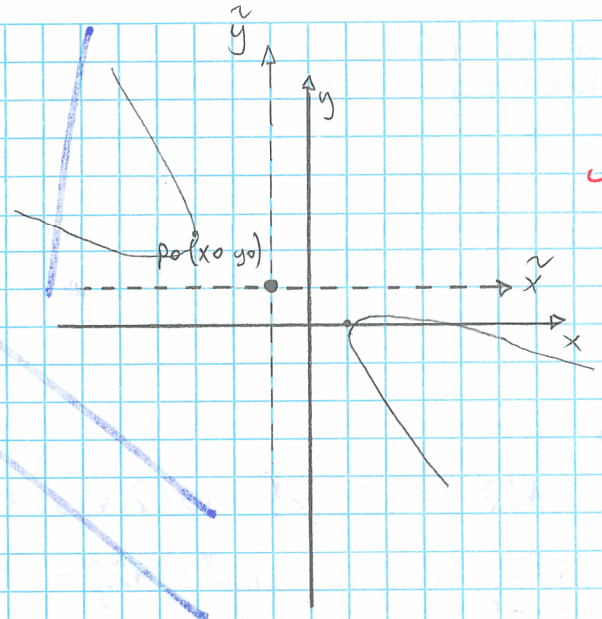
sustituyendo y_0 en ① $\Rightarrow$ $-4x_0 - 14(1) + 10 = 0$
$-4x_0 - 4 = 0$
$-4x_0 = 4$
$x_0 = 4/-4$
$x_0 = -1$ ∴ centro en $x_0 = -1$, $y_0 = 1$

sustituyendo en (#)
$-2\tilde{x}^2 - 14\tilde{x}\tilde{y} - 11\tilde{y}^2 - 2x_0^2 - 11y_0^2 - 14x_0y_0 + 10x_0 + 8y_0 - 9 = 0$

$-2\tilde{x}^2 - 14\tilde{x}\tilde{y} - 11\tilde{y}^2 - 2 - 11 + 14 - 10 + 8 - 9 = 0$

$-2\tilde{x}^2 - 14\tilde{x}\tilde{y} - 11\tilde{y}^2 - 10 = 0$

(Gráfica al reverso)



bien !