

Answer on Question #83499 – Math – Analytic Geometry

Question

Define the type of $x^2+10x-4y^2+4y+24=0$ and plot it.

Solution

$$(X^2 + 10x + 25) - 25 - 4(y^2 - y + 1/4) + 1 + 24 = 0$$

$$(x + 5)^2 - 4(y - 1/2)^2 = 0$$

$$(x + 5 - 2y + 1)(x + 5 + 2y - 1) = 0$$

$$(x - 2y + 6)(x + 2y + 4) = 0$$

In this way, the initial equation is split into two straight-line equations:

$$x - 2y + 6 = 0 \quad (1)$$

$$x + 2y + 4 = 0 \quad (2)$$

The solution of the system of equations (1), (2) is $x = -5, y = \frac{1}{2}$.

The type of the initial equation is the second order curve type: two straight lines that intersect, that is, the point with coordinates $(-5, \frac{1}{2})$.

