

Answer on Question #57359 – Math – Analytic Geometry

Question

Which conic section does the equation below describe?

$$2x^2 + 2y^2 - 6x + 4y + 1 = 0$$

- a) Parabola;
- b) Circle;
- c) Ellipse;
- d) Hyperbola.

Solution

At first, we rewrite the initial equation:

$$\begin{aligned} 2x^2 + 2y^2 - 6x + 4y + 1 &= 2\left(x^2 - 3x + \frac{9}{4}\right) - \frac{9}{2} + 2(y^2 + 2y + 1) - 2 + 1 = \\ &= 2\left(x - \frac{3}{2}\right)^2 + 2(y + 1)^2 - \frac{11}{2} = 0. \end{aligned}$$

Now we can write the equation in form:

$$\left(x - \frac{3}{2}\right)^2 + (y + 1)^2 = \frac{11}{4}.$$

We see that it is equation of circle.

Answer:

- b) Circle.