

Answer on Question #57354 - Math – Analytic Geometry

Question

1) What are the coordinates of the center of the circle shown below?

Express your answer in the form (a,b) without using spaces.

$$x^2 + y^2 - 2x + 6y + 9 = 0$$

Answer: _____

Solution

$$x^2 + y^2 - 2x + 6y + 9 = 0$$

$$x^2 - 2x + 1 + y^2 + 6y + 9 - 1 = 0$$

$$(x - 1)^2 + (y + 3)^2 = 1$$

Thus, the center is (1, -3).

Answer: (1, -3).

Question

2) What is the radius of the circle shown below?

$$x^2 + y^2 - 12x - 6y + 9 = 0$$

Answer: _____

Solution

$$x^2 + y^2 - 12x - 6y + 9 = 0$$

$$x^2 - 12x + 36 + y^2 - 6y + 9 - 36 = 0$$

$$(x - 6)^2 + (y + 3)^2 = 6^2$$

Thus, the radius is 6.

Answer: 6.

Question

3) What is the length of the major axis of the conic section shown below?

$$\frac{(x+2)^2}{49} + \frac{(y-1)^2}{25} = 1$$

Answer: _____

Solution

$$\begin{aligned} \frac{(x+2)^2}{49} + \frac{(y-1)^2}{25} &= 1 \\ \frac{(x+2)^2}{7^2} + \frac{(y-1)^2}{5^2} &= 1 \\ \Rightarrow \begin{cases} a = 7 \\ b = 5 \end{cases} \end{aligned}$$

Major axis: the longest diameter of an ellipse is $2a = 14$.

Answer: 14.