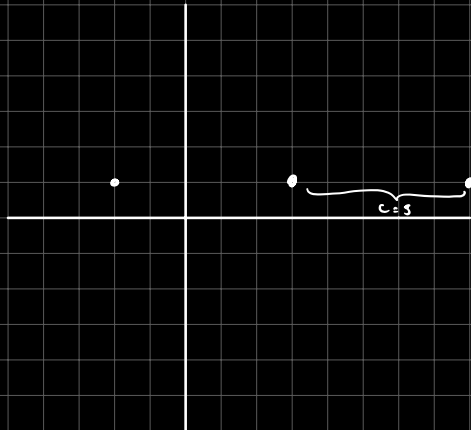


- a) Determine la ecuación de la elipse de centro $C(3,1)$, un Foco en $F(8,1)$ y el eje menor mide 1



$$b = 0.5 (\text{eje menor} = 2b), \quad c = 5$$

$$\text{Ecuación Seitch: } \frac{(x-3)^2}{\frac{101}{4}} + \frac{(y-1)^2}{\frac{1}{4}}$$

Forma General

$$Ax^2 + Bx^2 + Cx + Dy + E = 0 \quad / \text{ con } A \text{ y } B \text{ distintas e igual signo para identificar la elipse.}$$

Para obtener la Fórmula Principal
Completamos Cuadrados

Pasos Para obtener una elipse:

1) Obtener el valor del semi eje mayor

$$a^2 \rightarrow a \Rightarrow A(a, 0), A'(-a, 0)$$

2) Obtener el valor del semi eje menor

$$b^2 \rightarrow b \Rightarrow B(0, b), B'(0, -b)$$

3) Focos

$$c = \sqrt{a^2 - b^2} \rightarrow c = \Rightarrow F(c, 0), F'(-c, 0)$$

4) Excentricidad

$$e = \frac{c}{a}$$

5) Graficar

Ejercicios:

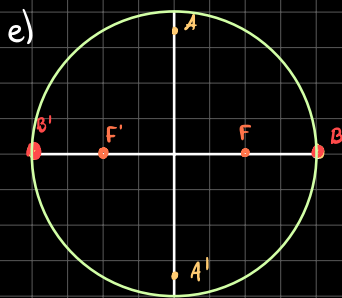
$$1) \frac{x^2}{16} + \frac{y^2}{12} = 1$$

$$a) a^2 = 16 \rightarrow a = 4 \Rightarrow A(4, 0), A'(-4, 0)$$

$$b) b^2 = 12 \rightarrow b = 2\sqrt{3} \Rightarrow B(0, 2\sqrt{3}), B'(0, -2\sqrt{3})$$

$$c) c = \sqrt{16 - 12} = 2 \Rightarrow F(2, 0), F'(-2, 0)$$

$$d) e = \frac{2}{4} = \frac{1}{2}$$



$$2) \quad x^2 + 4y^2 = 16 \quad / \quad 16$$

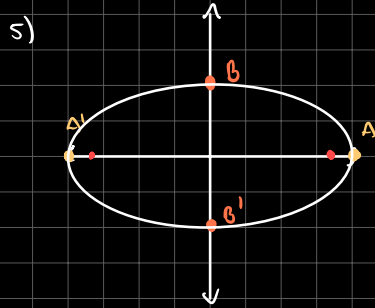
$$\frac{x^2}{16} + \frac{y^2}{4} = 1$$

$$a) \quad 16^2 \rightarrow 4 \Rightarrow A(4,0), A'(-4,0)$$

$$b) \quad 4^2 \rightarrow 2 \Rightarrow B(0,2), B(0,-2)$$

$$c) \quad c = \sqrt{a^2 - b^2} = \sqrt{16 - 4} = \sqrt{12} \Rightarrow F(2\sqrt{3}, 0), F'(-2\sqrt{3}, 0)$$

$$d) \quad e = \frac{c}{a} = \frac{2\sqrt{3}}{4} \rightarrow \frac{\sqrt{3}}{2}$$



$$3) \quad \frac{x^2}{9} + \frac{y^2}{25} = 1$$

$$\frac{x^2}{3^2} + \frac{y^2}{5^2} = 1$$

$$a) \quad 9 \rightarrow 3 \Rightarrow A(3,0), A'(-3,0)$$

$$b) \quad 25 \rightarrow 5 \Rightarrow B(0,5), B'(0,-5)$$

$$c) \quad c \rightarrow \sqrt{25 - 9} = \sqrt{16} = 4 \Rightarrow F(4,0), F'(-4,0)$$

$$d) \quad e = \frac{c}{a} = \frac{4}{3}$$

$$c) 3x^2 + 2y^2 = 6 \quad / : 6$$

$$\frac{x^2}{2} + \frac{y^2}{3} = 1$$

$$a) 3 = \sqrt{3} \Rightarrow A(0, \sqrt{3}), A'(0, -\sqrt{3})$$

$$b) 2 = \sqrt{2} \Rightarrow B(2, 0), B'(-2, 0)$$

$$c) c \rightarrow \sqrt{3-2} = \sqrt{1} = 1, F(0, 1), F'(0, -1)$$

$$5) x^2 + 2y^2 - 2x + 8y + 5 = 0$$

$$(x^2 - 2x) + (2y^2 + 8y) = -5$$

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

$$(x^2 - 2x + 1) + 2(y^2 + 4y + 4) - 8 + 5 - 1 = 0$$

$$(x^2 - 1)^2 + 2(y + 2)^2 = 4 \quad / 4$$

$$\frac{(x^2 - 1)^2}{4} + \frac{(y + 2)^2}{2} = 1 \quad (\text{Encontrar Centro } (h, k))$$

$$C(1, -2)$$

eje mayor

$$a = 4 = 2 \Rightarrow A(3, -2), A'(-1, -2)$$

eje menor

$$b = 2 = \sqrt{2} \Rightarrow B(1, -2 + \sqrt{2}), B'(1, -2 - \sqrt{2})$$

Focos

$$c = \sqrt{4-2} = \sqrt{2} \Rightarrow F(1 + \sqrt{2}, -2), F'(1 - \sqrt{2}, -2)$$

$$6) 25x^2 + 9y^2 - 18y - 216 = 0$$

$$25x^2 + (9y^2 - 18y) - 216 = 0$$

$$25x^2 + 9(y^2 - 2y + 1) - 9 - 216 = 0$$

$$25x^2 + 9(y^2 - 2y + 1) = 225 \quad / : 225$$

$$\frac{x^2}{9} + \frac{y^2 - 2y + 1}{25} = 1$$

$$C(0, 1)$$

$$a) a = 25 \rightarrow 5 \Rightarrow A(0, 6), A'(0, -4)$$

$$b) b = 9 \rightarrow 3 \Rightarrow B(3, 1), B'(-3, 1)$$

$$c) c = \sqrt{25-9} = 4 \Rightarrow (0, 5), F'(0, -3)$$

$$\begin{aligned}
 7) \quad & x^2 + 3y^2 - 6x + 6y = 0 \\
 & (x^2 - 6x) + (6y + 3y^2) = 0 \\
 & (x^2 - 6x) + (3y^2 + 6y) = 0 \\
 & (x^2 - 6x + 9) - 9 + 3(y^2 + 2y) = 0 \\
 & (x^2 - 3) + 3(y^2 + 2y + 1) = 9 \\
 & (x^2 - 3) + 3(y^2 + 1) = 9 + 3 \\
 & \frac{(x^2 - 3)}{12} + \frac{(y^2 + 1)}{4} = 1
 \end{aligned}$$

$$C(3, -1)$$

$$a) a^2 = 12 \rightarrow 2\sqrt{3} \Rightarrow A(3+2\sqrt{3}, -1), A'(3-2\sqrt{3}, -1)$$

$$b) b^2 = 4 \rightarrow 2 \Rightarrow B(3, 1), B'(3, -3)$$

$$c) c = \sqrt{12 - 4} = 2\sqrt{2} \Rightarrow F(3+2\sqrt{2}, -1), F'(3-2\sqrt{2}, -1)$$

$$\begin{aligned}
 8) \quad & 3x^2 + y^2 - 24x + 39 = 0 \\
 & (3x^2 - 24x) + y^2 + 39 = 0 \\
 & 3(x^2 - 8x) + y^2 + 39 = 0 \\
 & 3(x^2 - 8x + 16) + y^2 - 48 + 39 = 0 \\
 & 3(x - 4)^2 + y^2 - 9 = 0 \\
 & \frac{(x - 4)^2}{3} + \frac{y^2}{9} = 1
 \end{aligned}$$

$$C(4, 0)$$

$$a) a^2 \rightarrow 9 \rightarrow 3 \Rightarrow A(4, 3), A'(4, -3)$$

$$b) b^2 \rightarrow 3 \rightarrow \sqrt{3} \Rightarrow B(4+\sqrt{3}, 0), B'(4-\sqrt{3}, 0)$$

$$c) c = \sqrt{9-3} = \sqrt{6} \Rightarrow F(4, \sqrt{6}), F'(4, -\sqrt{6})$$

a) Determinar la ecuación de la elipse conociendo:

$$a) C(0,0), F(2,0), A(3,0)$$

$$\frac{x^2}{9} + \frac{y^2}{5} = 1$$

$$b = \sqrt{a^2 - c^2}$$

$$b = \sqrt{9 - 4}$$

$$b = \sqrt{5}$$

$$b) C(0,0), F(0,4), A(0,5)$$

$$\frac{x^2}{9} + \frac{y^2}{25} = 1$$

$$a^2 = b^2 + c^2$$

$$a = \sqrt{25 - 16}$$

$$a = \sqrt{9} = 3$$

$$c) C(-3,2), F(-1,2), A(2,2)$$

$$\frac{(x+3)^2}{9} + \frac{(y-2)^2}{4} = 1$$

$$c^2 = 4$$

$$-1 + 4 = 3$$