

Ejercicios Cónicas.

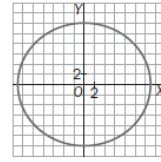
6.42

a) $\frac{x^2}{169} + \frac{y^2}{144} = 1$ b) $16x^2 + 25y^2 = 400$ c) $\frac{(x-3)^2}{10} + \frac{(y+2)^2}{6} = 1$ d) $2(x-1)^2 + y^2 = 2$

a) $a = 13$ $b = 12$ $c = \sqrt{169 - 144} = 5$

Vértices: $(-13, 0)$ $(13, 0)$ $(0, 12)$ $(0, -12)$ Focos: $(5, 0)$ $(-5, 0)$

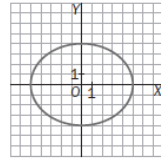
Excentricidad: $e = \frac{c}{a} = \frac{5}{13}$



b) $\frac{x^2}{25} + \frac{y^2}{16} = 1 \Rightarrow a = 5$ $b = 4$ $c = \sqrt{25 - 16} = 3$

Vértices: $(5, 0)$ $(-5, 0)$ $(0, 4)$ $(0, -4)$ Focos: $(-3, 0)$ $(3, 0)$

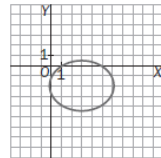
Excentricidad: $e = \frac{c}{a} = \frac{3}{5}$



c) $a = \sqrt{10}$ $b = \sqrt{6}$ $c = \sqrt{10 - 6} = 2$

Vértices: $(3 - \sqrt{10}, -2)$ $(3 + \sqrt{10}, -2)$ $(3, -2 - \sqrt{6})$ $(3, -2 + \sqrt{6})$

Focos: $(1, -2)$ $(5, -2)$ Excentricidad: $e = \frac{c}{a} = \frac{2}{\sqrt{10}}$

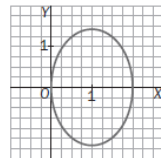


d) $\frac{(x-1)^2}{1} + \frac{y^2}{2} = 1$

$a = \sqrt{2}$ $b = 1$ $c = \sqrt{2 - 1} = 1$

Vértices: $(2, 0)$ $(0, 0)$ $(1, \sqrt{2})$ $(1, -\sqrt{2})$

Focos: $(1, 1)$ $(1, -1)$ Excentricidad: $e = \frac{c}{a} = \frac{1}{\sqrt{2}}$



6.43

a) $b = \sqrt{25 - 9} = 4 \Rightarrow \frac{x^2}{25} + \frac{y^2}{16} = 1$

b) $2a = 7 + 3 \Rightarrow a = 5$, $c = 4$, $b = \sqrt{25 - 16} = 3 \Rightarrow \frac{x^2}{25} + \frac{y^2}{9} = 1$

c) $a = 4$, $c = 3$, $b = \sqrt{16 - 9} = \sqrt{7} \Rightarrow \frac{x^2}{16} + \frac{y^2}{7} = 1$

d) $a = 6$, $b = 3 \Rightarrow \frac{x^2}{36} + \frac{y^2}{9} = 1$

e) $c = 2$, $e = \frac{c}{a} \Rightarrow a = \frac{2}{0,4} = 5 \Rightarrow b = \sqrt{25 - 4} = \sqrt{21} \Rightarrow \frac{x^2}{25} + \frac{y^2}{21} = 1$

f) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \Rightarrow \begin{cases} \frac{1}{a^2} + \frac{4}{b^2} = 1 \\ \frac{4}{a^2} = 1 \end{cases} \Rightarrow a = 2, b = \frac{4}{\sqrt{3}} \Rightarrow \frac{x^2}{4} + \frac{y^2}{\frac{16}{3}} = 1$

6.45

a) $b = \sqrt{25 - 9} = 4 \Rightarrow \frac{x^2}{9} - \frac{y^2}{16} = 1$

b) $2a = 10 - 2 \Rightarrow a = 4$, $c = 5$, $b = \sqrt{25 - 16} = 3 \Rightarrow \frac{x^2}{16} - \frac{y^2}{9} = 1$

c) $a = 2$, $c = 4$, $b = \sqrt{16 - 4} = \sqrt{12} \Rightarrow \frac{x^2}{4} - \frac{y^2}{12} = 1$

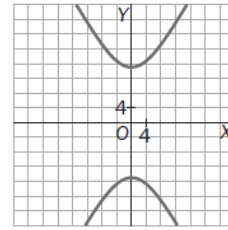
d) $\frac{x^2}{36} + \frac{y^2}{9} = 1$

d) $a = 15, b = 8, c = \sqrt{225 + 64} = 17$

Vértices: $(0, 15)$ $(0, -15)$ Focos: $(0, -17)$ $(0, 17)$

Asíntotas: $y = \pm \frac{8}{15}x$

Excentricidad: $e = \frac{c}{a} = \frac{17}{15}$

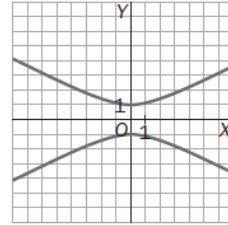


e) $\frac{y^2}{1} - \frac{x^2}{4} = 1, a = 1, b = 2, c = \sqrt{5}$

Vértices: $(0, 1)$ $(0, -1)$ Focos: $(0, -\sqrt{5})$ $(0, \sqrt{5})$

Asíntotas: $y = \pm 2x$

Excentricidad: $e = \frac{c}{a} = \sqrt{5}$



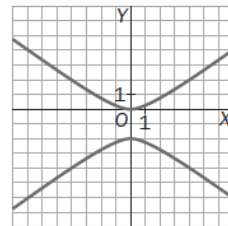
f) $\frac{(y+1)^2}{1} - \frac{x^2}{2} = 1$

$a = 1, b = \sqrt{2}, c = \sqrt{3}$

Vértices: $(0, 0)$ $(0, -2)$ Focos: $(0, -1+\sqrt{3})$ $(0, -1-\sqrt{3})$

Asíntotas: $x = \pm\sqrt{2}(y+1)$

Excentricidad: $e = \frac{c}{a} = \sqrt{3}$

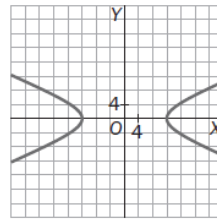


a) $a = 12, b = 5, c = \sqrt{144 + 25} = 13$

Vértices: $(-12, 0)$ $(12, 0)$ Focos: $(-13, 0)$ $(13, 0)$

Asíntotas: $y = \pm \frac{5}{12}x$

Excentricidad: $e = \frac{c}{a} = \frac{13}{12}$

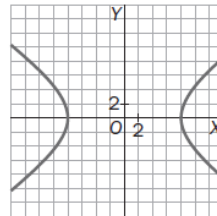


b) $\frac{x^2}{64} - \frac{y^2}{36} = 1, a = 8, b = 6, c = 10$

Vértices: $(-8, 0)$ $(8, 0)$ Focos: $(-10, 0)$ $(10, 0)$

Asíntotas: $y = \pm \frac{3}{4}x$

Excentricidad: $e = \frac{c}{a} = \frac{5}{4}$



c) $a = \sqrt{8}, b = \sqrt{6}, c = \sqrt{14}$

Vértices: $(-1 - \sqrt{8}, 2)$ $(-1 + \sqrt{8}, 2)$

Focos: $(-1 - \sqrt{14}, 2)$ $(-1 + \sqrt{14}, 2)$

Asíntotas: $y - 2 = \pm \frac{\sqrt{6}}{\sqrt{8}}(x + 1)$

Excentricidad: $e = \frac{c}{a} = \frac{\sqrt{14}}{\sqrt{8}} = \sqrt{\frac{7}{4}}$

