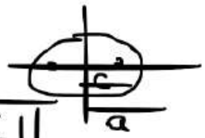
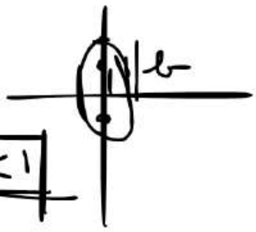
Lezione 14

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



$c < a \Rightarrow \boxed{e<1}$

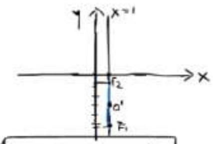
$e = \frac{c}{b}$



$c < b \Rightarrow \boxed{e<1}$

Eccentricità dell'ellisse

Rappresenta il rapporto fra la semidistanza focale e la lunghezza del semiasse dove sono contenuti i fuochi



$e = \frac{\sqrt{10}}{4} = \frac{c}{b}$

$O' = (1; -3)$

$\boxed{2c = 2\sqrt{5}}$

$\boxed{c = \frac{\cancel{2}\sqrt{5}}{\cancel{2}} = \sqrt{5}}$ SEMID FOCALE

$F_1(1; -3-\sqrt{5}) \quad F_2(1; -3+\sqrt{5})$

$e = \frac{\sqrt{10}}{4} \quad e = \frac{c}{b}$

$b = \frac{c}{e} = \frac{\sqrt{5}}{\frac{\sqrt{10}}{4}} =$

$= \frac{4\cancel{\sqrt{5}}^{1}}{\cancel{\sqrt{5}}\sqrt{2}} = \frac{4}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\cancel{4}^{2}\sqrt{2}}{\cancel{2}}$

$\boxed{b = 2\sqrt{2}}$

$c^2 = b^2 - a^2$

$a^2 = b^2 - c^2 = (2\sqrt{2})^2 - (\sqrt{5})^2$

$a^2 = 8 - 5 = 3 \Rightarrow a^2 = 3$

$b^2 = 8$

$\frac{(x - x_{0'})^2}{a^2} + \frac{(y - y_{0'})^2}{b^2} = 1$

$$\boxed{\frac{(x-1)^2}{3} + \frac{(y+3)^2}{8} = 1}$$

$\frac{(y+3)^2}{8} = 1 - \frac{(x-1)^2}{3}$

$$\boxed{\begin{aligned} (y+3)^2 &= 8\left[1 - \frac{(x-1)^2}{3}\right] \\ y+3 &= \pm\sqrt{8\left[1 - \frac{(x-1)^2}{3}\right]} \\ y &= -3 \pm\sqrt{8\left[1 - \frac{(x-1)^2}{3}\right]} \end{aligned}}$$

$$\begin{cases} \frac{a}{b} = \frac{2}{3} \\ a + b = 15 \end{cases}$$

$$\boxed{\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1}$$

$O'(x_0; y_0)$

$$\boxed{\frac{a}{b} = \frac{2}{3}}$$

$$\boxed{a + b = 15}$$

$c \in r: y = x+1$

$V(7;2)$

$$\begin{cases} a = \frac{2}{3} b \\ \frac{2}{3} b + b = 15 \end{cases}$$

$$\cancel{3}\,\frac{2b + 3b}{\cancel{3}} = \frac{45}{\cancel{3}}\,\cancel{3}$$

$$5b = 45 \implies \boxed{b = 9} \implies b^2 = 81$$

$$a = \frac{2}{3} b = \frac{2}{\cancel{3}} \cdot \cancel{9}3 = 6$$

$$\boxed{a = 6} \implies a^2 = 36$$

$$\boxed{\frac{x^2}{36} + \frac{y^2}{81} = 1}$$

$V(7;2)$

$O'(x;2)$

$2 = x + 1$

$x = 1$

$O'(1;2)$

$$\frac{(x-1)^2}{36} + \frac{(y-1)^2}{81} = 1$$

$$(y-1)^2 = 81\left[1 - \frac{(x-1)^2}{36}\right]$$

$$y - 1 = \pm\sqrt{81\left[1 - \frac{(x-1)^2}{36}\right]}$$

$$\boxed{y = 1 \pm 9\sqrt{1 - \frac{(x-1)^2}{36}}}$$