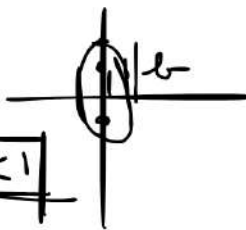


Lezione 14

$$e = \frac{c}{a}$$
$$c < a \Rightarrow \boxed{e < 1}$$
A diagram of an ellipse centered at the origin of a Cartesian coordinate system. The horizontal axis is labeled 'a' at its right end, representing the semi-major axis. Two foci are marked with dots on the horizontal axis, and the distance from the center to one focus is labeled 'c'.

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

$$e = \frac{c}{b}$$
$$c < b \Rightarrow \boxed{e < 1}$$
A diagram of a vertical ellipse centered at the origin of a Cartesian coordinate system. The vertical axis is labeled 'b' at its top end, representing the semi-minor axis. Two foci are marked with dots on the vertical axis, and the distance from the center to one focus is labeled 'c'.

$x = \frac{\sqrt{10}}{4} = \frac{c}{4}$
 $O' = (1, -3)$

$c = \frac{2\sqrt{5}}{2} = \sqrt{5}$ SEMI-DIAGONAL
 $2c = 2\sqrt{5}$ FOCAL

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

$r = \frac{\sqrt{10}}{4}$ $\frac{c}{4} = \frac{\sqrt{5}}{4}$
 $b = \frac{c}{2} = \frac{\sqrt{5}}{2}$
 $= \frac{4\sqrt{5}}{2\sqrt{2}\sqrt{2}} = \frac{4}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{\sqrt{2}} = 2$

$b = 2\sqrt{2}$

$a^2 = b^2 - c^2 = (2\sqrt{2})^2 - (\sqrt{5})^2$
 $a^2 = 8 - 5 = 3 \Rightarrow a^2 = 3$
 $b^2 = 8$

$\frac{(x-x_0)^2}{a^2} + \frac{(y-y_0)^2}{b^2} = 1$
 $\frac{(x-1)^2}{3} + \frac{(y+3)^2}{8} = 1$

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

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

$$\begin{cases} \frac{a}{b} = \frac{2}{3} \\ a + b = 15 \end{cases} \quad \boxed{\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1} \quad \begin{matrix} O'(x_0, y_0) \\ \frac{a}{b} = \frac{2}{3} \\ a + b = 15 \end{matrix}$$

$$\begin{cases} a = \frac{2}{3}b \\ 2b + b = 15 \\ 3b = 15 \\ b = 5 \\ a = \frac{2}{3} \cdot 5 = \frac{10}{3} \end{cases} \quad \begin{matrix} c \in \mathbb{Z}: y = x + 1 \\ \sqrt{(7, 2)} \end{matrix}$$

$$5b = 45 \Rightarrow b = 9 \Rightarrow b^2 = 81$$

$$a = \frac{2}{3}b = \frac{2}{3} \cdot 9 = 6 \Rightarrow a^2 = 36$$

$$\boxed{\frac{x^2}{36} + \frac{y^2}{81} = 1} \quad \begin{matrix} \sqrt{(7, 2)} \\ O'(x_1, 2) \end{matrix}$$

$$O'(1, 2) \quad 2 = x + 1$$

$$x = 1$$

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

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

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

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