

IPERBOLE EQUILATERA

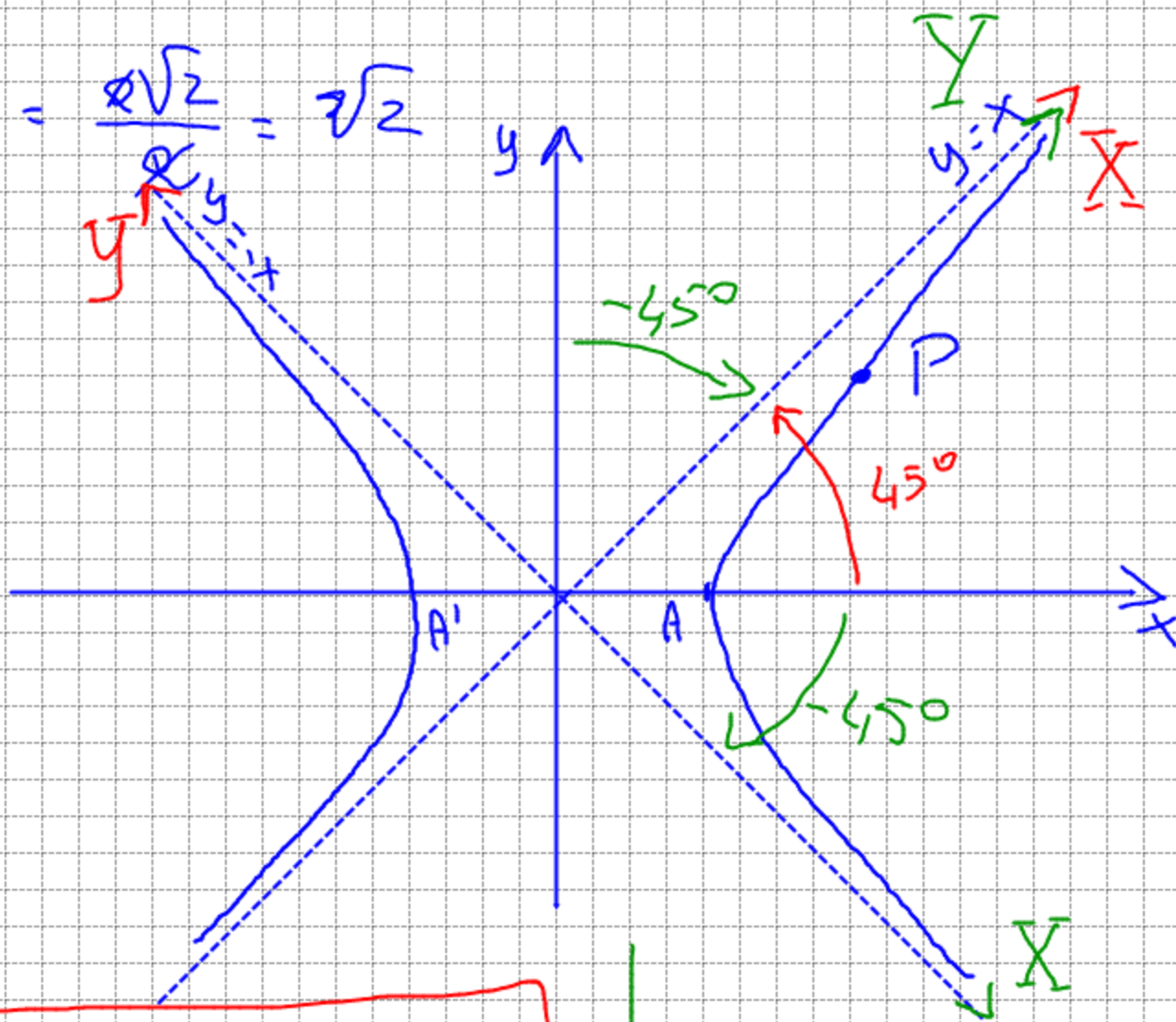
$$a=b \Rightarrow c^2=2a^2 \quad c=\pm a\sqrt{2}$$

1) $X^2 - Y^2 = a^2$ asse trasverso x

2) $X^2 - Y^2 = -a^2$ asse trasverso y

asintoti: $y = \pm x$

$$e = \frac{c}{a} = \frac{a\sqrt{2}}{a} = \sqrt{2}$$



+45°

$$\begin{cases} x = \frac{\sqrt{2}}{2} X - \frac{\sqrt{2}}{2} Y \\ y = +\frac{\sqrt{2}}{2} X + \frac{\sqrt{2}}{2} Y \end{cases}$$

-45°

$$\begin{cases} x = \frac{\sqrt{2}}{2} X + \frac{\sqrt{2}}{2} Y \\ y = -\frac{\sqrt{2}}{2} X + \frac{\sqrt{2}}{2} Y \end{cases}$$

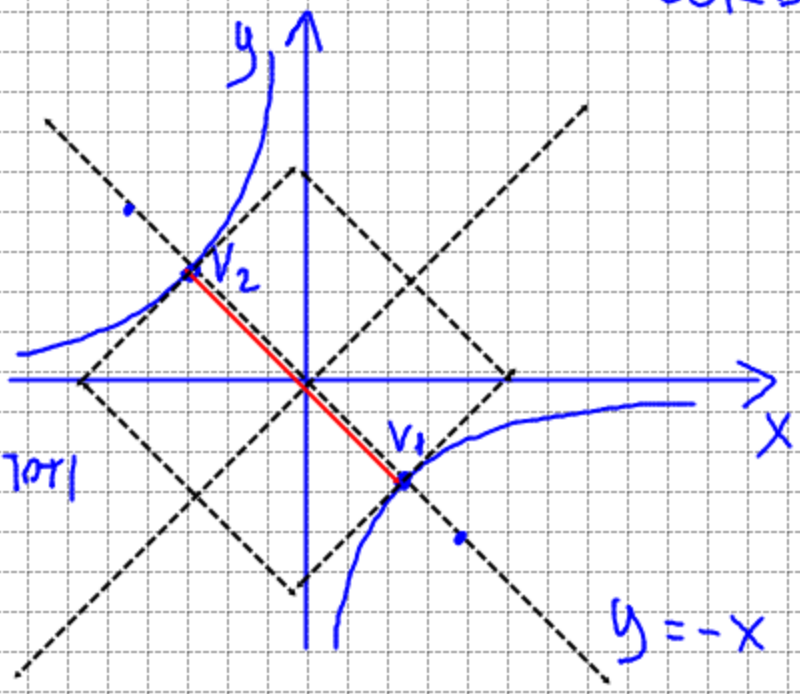
$$XY = -\frac{a^2}{2} \quad XY = \frac{a^2}{2}$$

IPERBOLI EQUILATERE RIFERITE AGLI ASSI COORDINATI

Esempio

$$xy = -4$$

$x=0$
 $y=0$ ASINTOTI



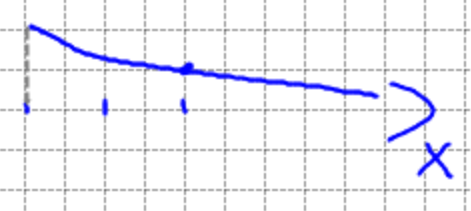
$$\begin{cases} xy = -4 \\ y = -x \end{cases} \Rightarrow \begin{cases} -x^2 = -4 \\ y = -x \end{cases} \Rightarrow \begin{cases} x = \pm 2 \\ y = \mp 2 \end{cases} \Rightarrow \begin{matrix} V_1(2; -2) \\ V_2(-2; 2) \end{matrix}$$

$$V_1 V_2 = \sqrt{(x_{V_1} - x_{V_2})^2 + (y_{V_1} - y_{V_2})^2} = \sqrt{16 + 16} = \sqrt{32} = 4\sqrt{2}$$

$$2a = 4\sqrt{2} \quad c = \pm a\sqrt{2} = \pm 2\sqrt{2} \cdot \sqrt{2} = \pm 4$$

$$F_1(-\sqrt{-2k}; \sqrt{-2k}) \quad F_2(\sqrt{-2k}; -\sqrt{-2k})$$

$$F_1(-2\sqrt{2}; 2\sqrt{2}) \quad F_2(2\sqrt{2}; -2\sqrt{2})$$



INTERSEZIONE IPERBOLE RETTA

$$\begin{cases} \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \\ y = mx + q \end{cases} \quad \frac{x^2}{a^2} - \frac{(mx+q)^2}{b^2} = 1$$

$$b^2 x^2 - a^2 (m^2 x^2 + q^2 + 2mqx) - a^2 b^2 = 0$$

$$(b^2 - a^2 m^2) x^2 - 2a^2 m q x - a^2 q^2 - a^2 b^2 = 0$$

$\Delta > 0$ 2 soluzioni distinte (RETTA INTERSECA IPERBOLE)

$\Delta = 0$ 2 soluzioni coincidenti (RETTA TANGENTE IPERBOLE)

$\Delta < 0$ 2 soluzioni complesse coniugate (RETTA NON INTERSECA IPERBOLE NEL CAMPO REALE)