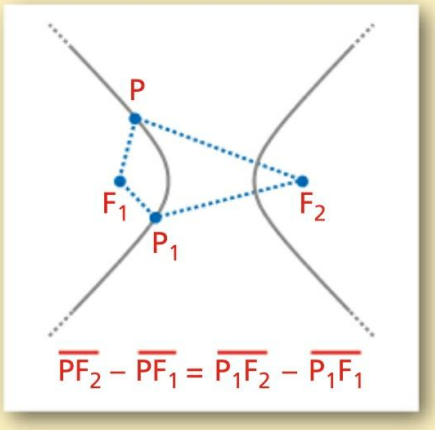
8/5/2018

IPERBOLE

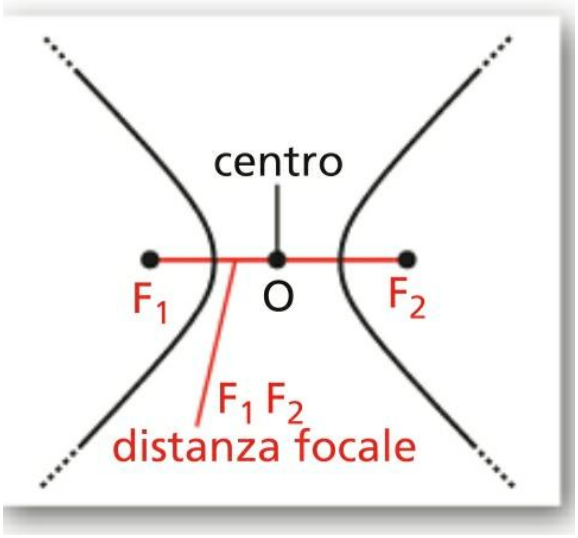
DEFINIZIONE

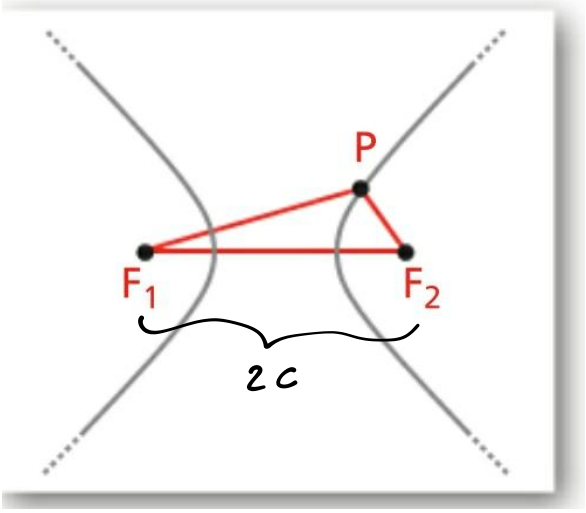
Assegnati nel piano due punti, F_1 e F_2, si chiama **iperbole** il luogo geometrico dei punti P del piano che hanno costante la differenza delle distanze da F_1 e da F_2:

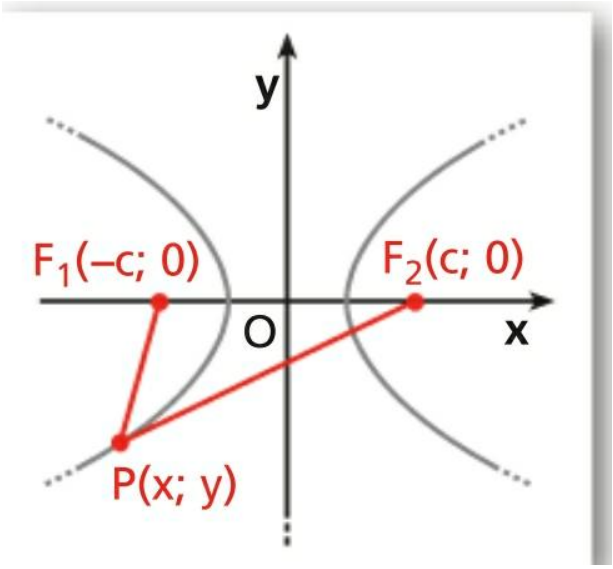
$$|\overline{PF_1} - \overline{PF_2}| = \textbf{costante}.$$



F_1, F_2 FUOCHI







c = SEMIDISTANZA FOCALE

$F_1(-c, 0) \quad F_2(c, 0)$

$|\overline{PF_1} - \overline{PF_2}| = 2a$

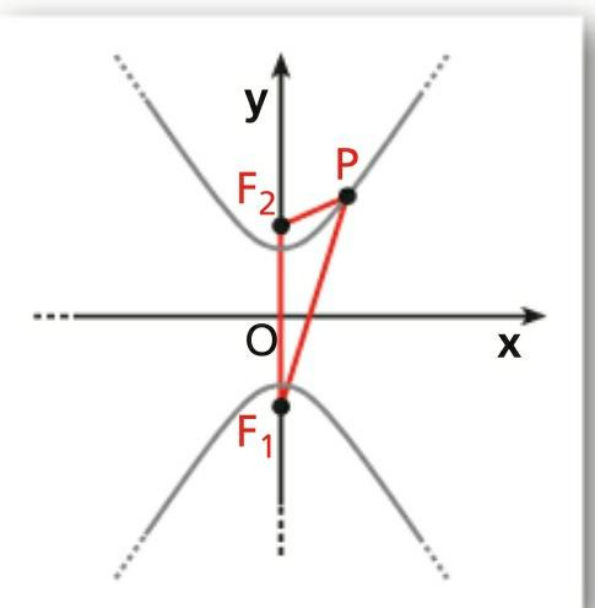
$2a < 2c \Rightarrow a < c$

DISUG. LATI TRIANGOLO

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

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

IPERBOLE COI FUOCHI SULL'ASSE x



$$|PF_1 - PF_2| = 2b$$

$$2b < 2c \Rightarrow b < c$$

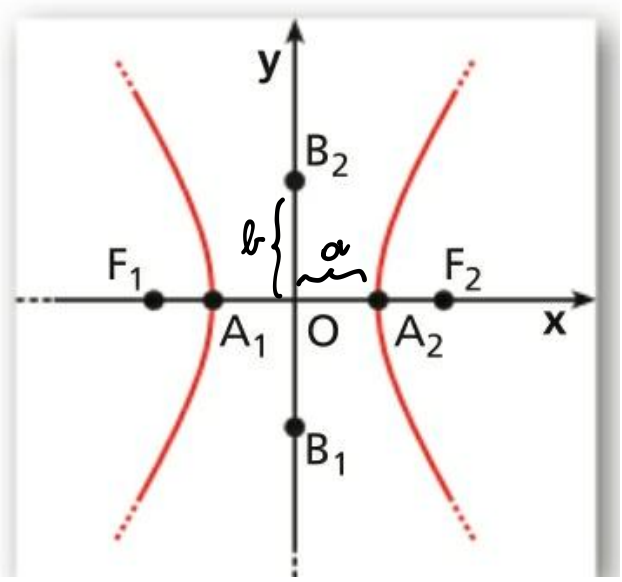
$$c^2 - b^2 = a^2$$

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

FUOCHI SULL'ASSE y

In entrambi i casi abbiamo che $a^2 + b^2 = c^2$

10/5/2018



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

a = SEMIASSE TRASVERSO

b = SEMIASSE NON TRASVERSO

$$\begin{cases} \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \\ y = 0 \end{cases} \Rightarrow \begin{cases} x^2 = a^2 \\ y = 0 \end{cases} \Rightarrow \begin{cases} x = -a \\ y = 0 \end{cases} \vee \begin{cases} x = a \\ y = 0 \end{cases}$$

$A_1(-a, 0)$ $A_2(a, 0)$

VERTICI DELL'IPERBOLE

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

$$= b^2\left[\frac{x^2}{a^2} - 1\right]$$

$$y^2 = b^2\left[\frac{x^2}{a^2} - 1\right]$$

$$\downarrow$$

$$y = \pm b\sqrt{\frac{x^2}{a^2} - 1}$$

$$\downarrow$$

$$y = \pm \frac{b}{a}\sqrt{x^2 - a^2}$$

$$y = -\frac{b}{a}\sqrt{x^2 - a^2} \simeq -\frac{b}{a}x$$

$$\vee$$

$$y = \frac{b}{a}\sqrt{x^2 - a^2} \simeq \frac{b}{a}x$$