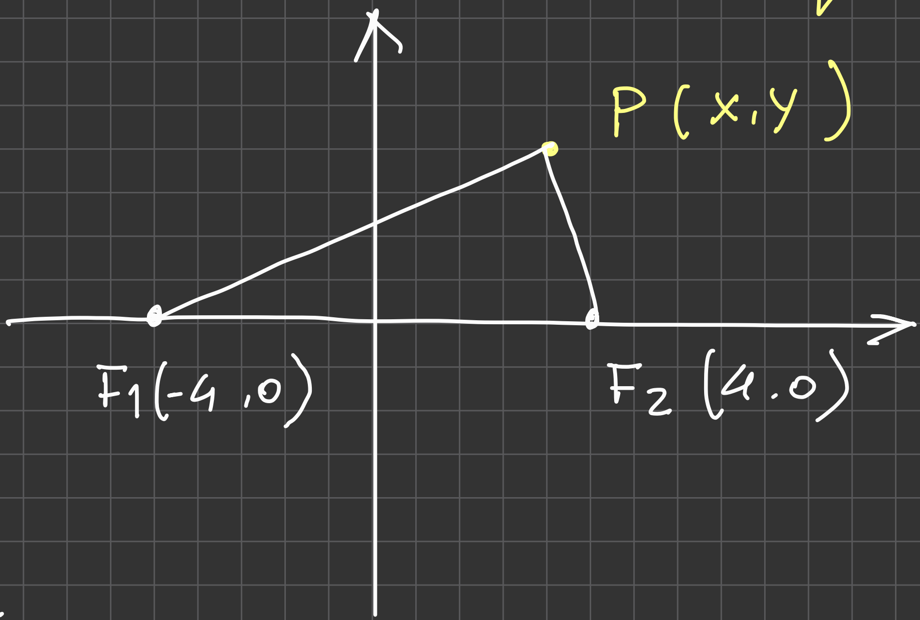
EQUAZIONE DELL'IPERBOLE

M3042

L'IPERBOLE: luogo dei punti tali che la differenza fra le distanze di tali punti dai fuochi è costante



$2a = 6$

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

$$\sqrt{(x_P - x_{F1})^2 + (y_P - y_{F1})^2} - \sqrt{(x_P - x_{F2})^2 + (y_P - y_{F2})^2} = 2a$$

$$\sqrt{(x+4)^2 + y^2} - \sqrt{(x-4)^2 + y^2} = 6$$

$$\sqrt{x^2 + 16 + 8x + y^2} = 6 + \sqrt{x^2 + 16 - 8x + y^2}$$

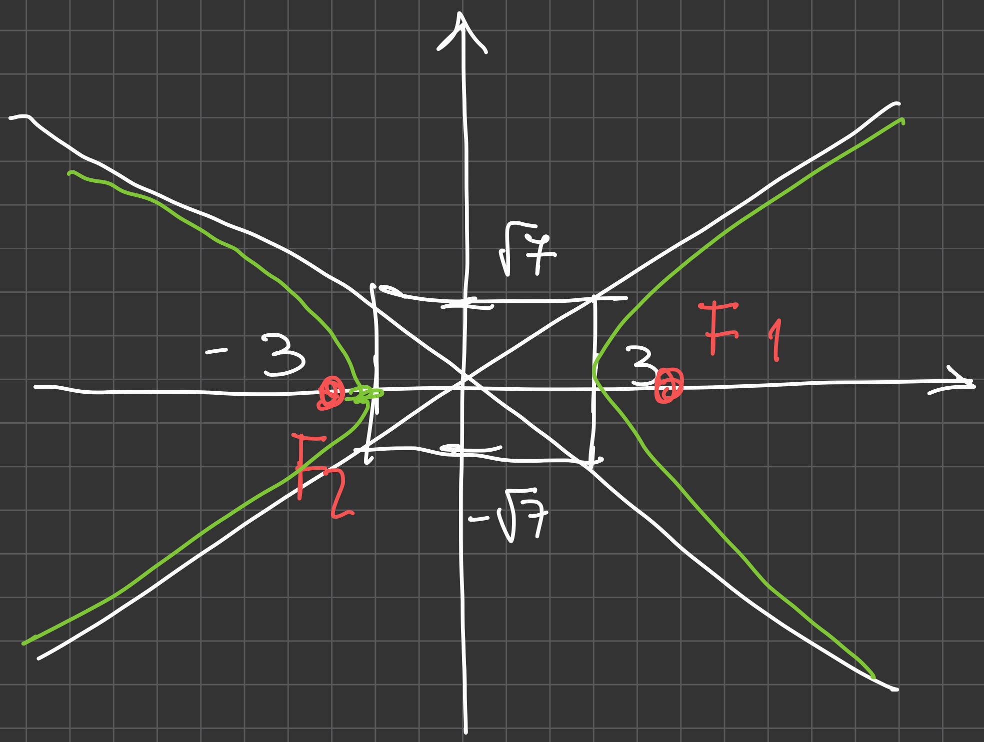
$$\cancel{x^2} + \cancel{16} + 8x + \cancel{y^2} = 36 + \cancel{x^2} + \cancel{16} - 8x + \cancel{y^2} + 12\sqrt{x^2 + 16 - 8x + y^2}$$

$$16x - 36 = 12\sqrt{x^2+16-8x+y^2}$$

$$(4x-9)^2 = \left(3\sqrt{x^2+16-8x+y^2}\right)^2$$

$$16x^2+81-\cancel{72x} = 9x^2+144-\cancel{72x}+9y^2$$

$$7x^2-9y^2 = 63 \quad \div 63 \longrightarrow \boxed{\frac{x^2}{9}-\frac{y^2}{7}=1}$$

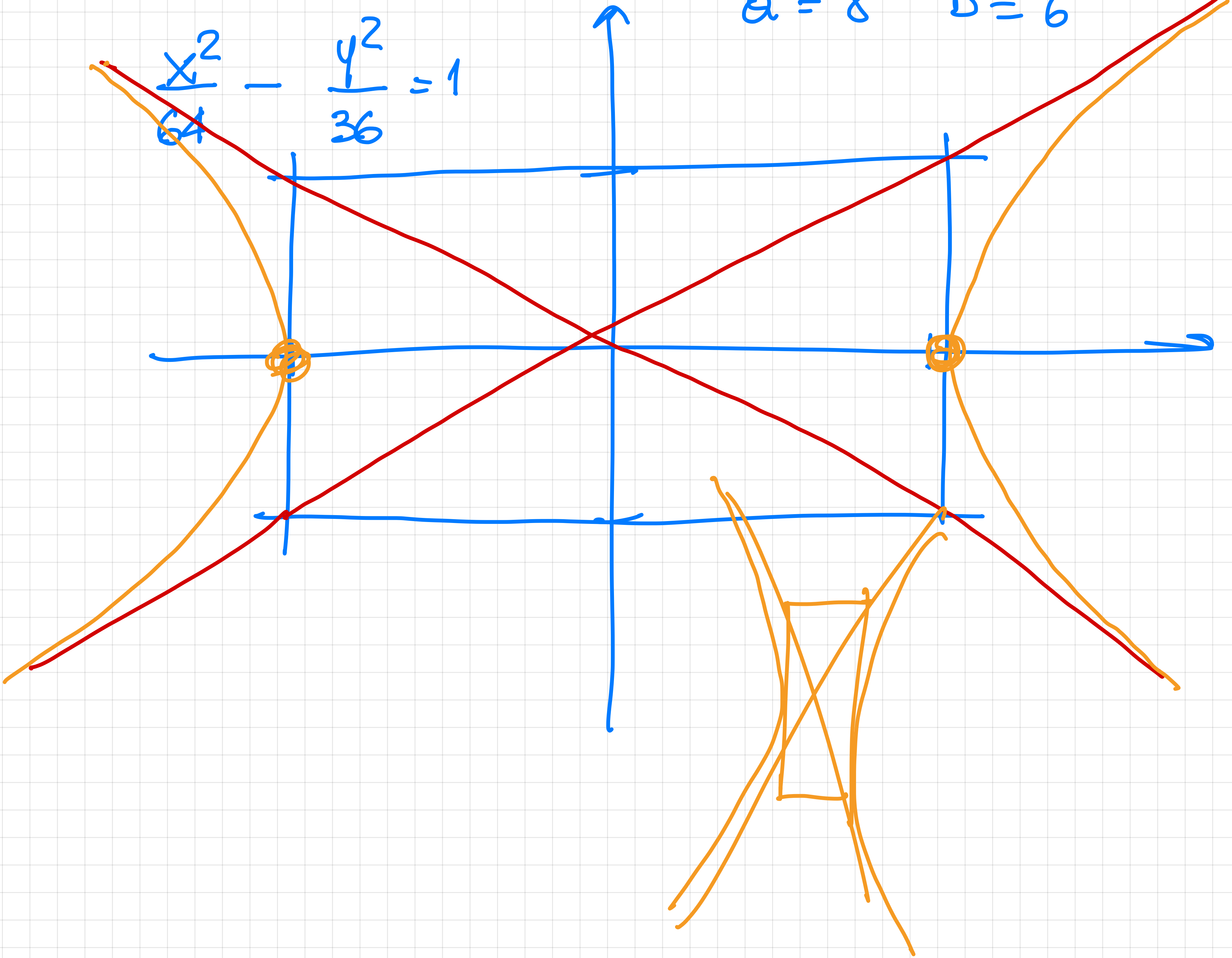


$$c^2 = \cancel{\sqrt{}}\, a^2+b^2 \Rightarrow F_1(4;0)$$

$$F_2(-4;0)$$

$\frac{x^2}{64} - \frac{y^2}{36} = 1$

$a = 8 \quad b = 6$



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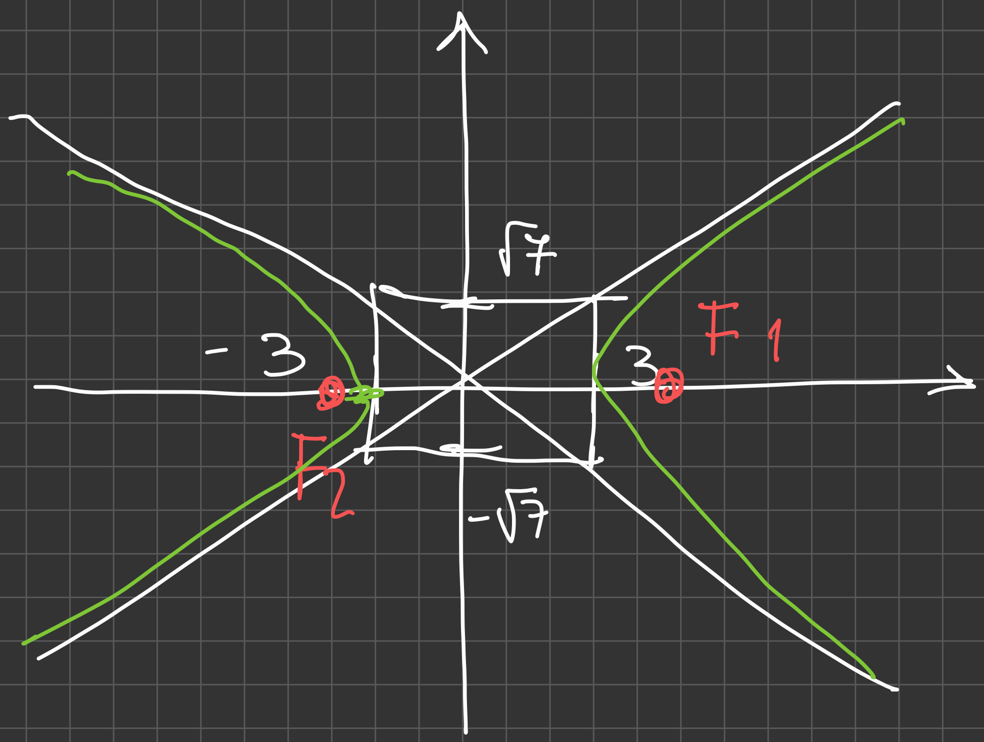

$$c^2 = \sqrt{a^2+b^2} \Rightarrow F_1(4;0)$$
$$F_2(-4;0)$$