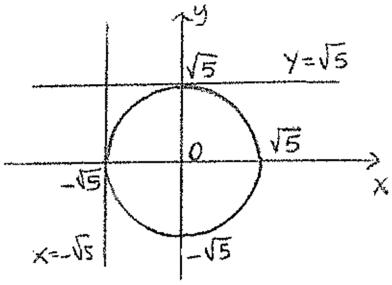
SOLUZIONI GEOMETRIA ANALITICA

170) i) $x^2+y^2=5 \quad C(0,0) \quad R=\sqrt{5}$



ii) $y=\sqrt{5}$ iii) $x=-\sqrt{5}$

iv) $C(0,0)$ $R=7$ $x^2+y^2=49$

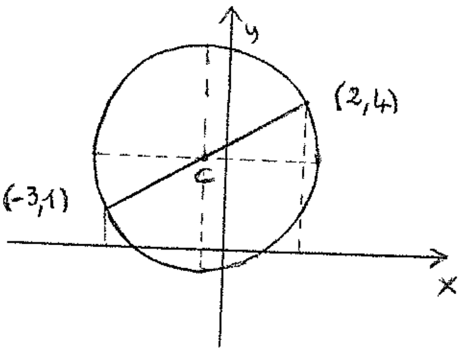
171) i) $(x-1)^2+(y-3)^2=16$

ii) $\left(x-\frac{3}{2}\right)^2+\left(y+\frac{1}{2}\right)^2=R^2$ per $A=\left(1,\frac{3}{2}\right)$ $\quad \frac{1}{4}+4=R^2 \quad R^2=\frac{17}{4} \quad \left(R=\frac{\sqrt{17}}{2}\right)$

$\left(x-\frac{3}{2}\right)^2+\left(y+\frac{1}{2}\right)^2=\frac{17}{4}$ (oppure $R=\text{dist}(C,A)=\sqrt{\left(\frac{1}{2}\right)^2+(-2)^2}=\sqrt{\frac{17}{4}}$)

iii) è la circonf. di centro C = punto medio del segmento AB e $R=\frac{1}{2}\text{dist}(A,B)$

$C=\left(\frac{-3+2}{2},\frac{1+4}{2}\right)=\left(-\frac{1}{2},\frac{5}{2}\right) \quad R=\frac{1}{2}\sqrt{5^2+3^2}=\frac{\sqrt{34}}{2}$



eq.^{ne} $\left(x+\frac{1}{2}\right)^2+\left(y-\frac{5}{2}\right)^2=\frac{34}{4}=\frac{17}{2}$

172) i) $(x-1)^2+(y+2)^2=3$

ii) $R=\text{dist}(C,(0,0))=\sqrt{1+\frac{25}{49}}=\frac{\sqrt{74}}{7}$

$(x-1)^2+\left(y-\frac{5}{7}\right)^2=\frac{74}{49}$

iii) $C\begin{cases} y=-2x \\ y=-\frac{3}{4}x-\frac{1}{4} \end{cases} \quad \begin{cases} -2x=-\frac{3}{4}x-\frac{1}{4} \\ \dots \end{cases} \quad \begin{cases} \frac{5}{4}x=\frac{1}{4} \\ \dots \end{cases} \quad \begin{cases} x=\frac{1}{5} \\ y=-\frac{2}{5} \end{cases}$

$C\left(\frac{1}{5},-\frac{2}{5}\right) \quad R=\sqrt{2} \quad \left(x-\frac{1}{5}\right)^2+\left(y+\frac{2}{5}\right)^2=2$

173) i) $C(0,0)$ $R=4$ ii) $C(-1,3)$ $R=3$ iii) $C(0,0)$ $R=2\sqrt{2}$

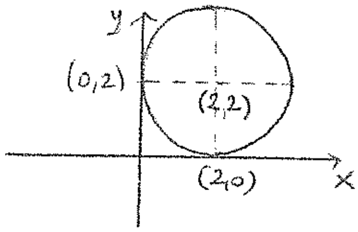
iv) $(x-1)^2+y^2=8+1=9 \quad C(1,0) \quad R=3$ v) $x^2+(y+2)^2=5 \quad C(0,-2) \quad R=\sqrt{5}$

vi) $x^2+y^2+\frac{2}{3}x+10y-\frac{122}{3}=0 \quad \left(x+\frac{1}{3}\right)^2+(y+5)^2=\frac{122}{3}+\frac{1}{9}+25=\frac{592}{9}$

$C\left(-\frac{1}{3},-5\right)$ e $R=\frac{\sqrt{592}}{3}=\frac{\sqrt{2^4\cdot 37}}{3}=\frac{4}{3}\sqrt{37}\simeq 8{,}11$

174) l'eq.^{ne} è $(x-1)^2+(y+2)^2=-1$ non ci sono p.^{ti} che verificano l'eq.^{ne} quindi <u>NON</u> rappresenta una circonferenza.

175) $C(2,2)$ $R=2$ è tangente ad entrambi gli assi



176) i) $y=a(x-x_V)^2+y_V$ $V(0,0)$

$y=ax^2$

$A\begin{cases} y=\frac{3}{2}x+1 \\ y=2x-3 \end{cases}$ $\begin{cases} 2x-3=\frac{3}{2}x+1 \\ \dots \end{cases}$ $\begin{cases} \frac{1}{2}x=4 \\ \dots \end{cases}$ $\begin{cases} x=8 \\ y=13 \end{cases}$ $A(8,13)$

$y=ax^2$ per A $13=a\cdot 64 \rightarrow a=\frac{13}{64}$ $y=\frac{13}{64}x^2$ EQ.^{ne}

ii) $y=ax^2+bx+c$ $\begin{cases} \text{per } (0,0) & c=0 \\ \text{per } (2,3) & 3=4a+2b \\ \text{per } (-1,4) & 4=a-b \end{cases}$ $\rightarrow$ $a=\frac{11}{6}$ $b=-\frac{13}{6}$

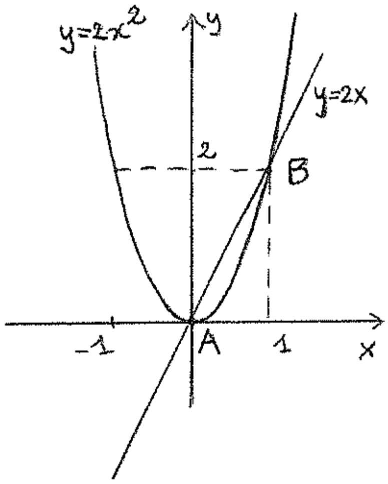
Eq.^{ne} $y=\frac{11}{6}x^2-\frac{13}{6}x$

iii) $y=a(x-x_V)^2+y_V$ $V(2,-3)$ $y=a(x-2)^2-3$ per $(0,0)$

$0=4a-3$ $a=\frac{3}{4}$ Eq.^{ne} $y=\frac{3}{4}(x-2)^2-3=\frac{3}{4}x^2-3x$

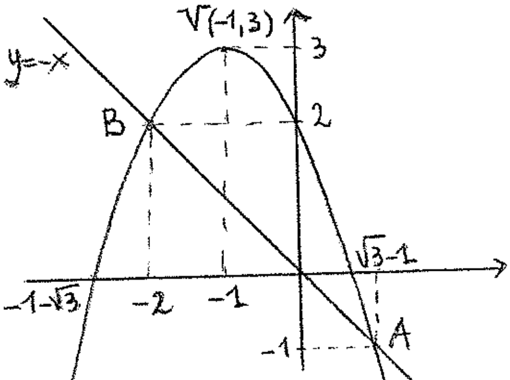
177) $\begin{cases} y=2x \\ y=2x^2 \end{cases}$ $\begin{cases} 2x^2=2x \\ \dots \end{cases}$ $\begin{cases} 2x(x-1)=0 \\ y=2x \end{cases}$ $\begin{cases} x=0 \text{ o } x=1 \\ y=2x \end{cases}$

INTERSEZIONI $A(0,0)$ $B(1,2)$



178) i) $\begin{cases} y=-x \\ y=-x^2-2x+2 \end{cases}$ $\begin{cases} x^2+x-2=0 \\ y=-x \end{cases}$ $\begin{cases} x=1 \text{ o } x=-2 \\ y=-x \end{cases}$

$A=(1,-1)$ $B(-2,2)$

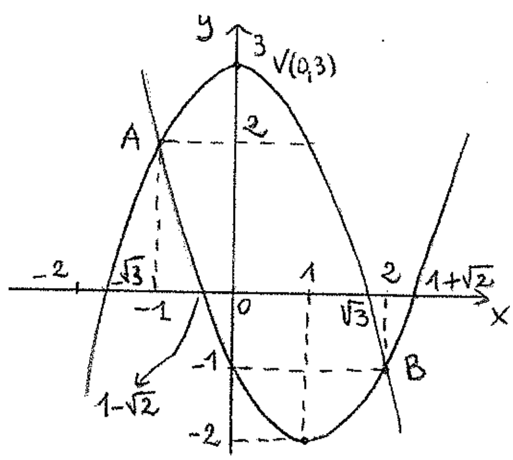


ii) $\begin{cases} y=3-x^2 \\ y=x^2-2x-1 \end{cases}$

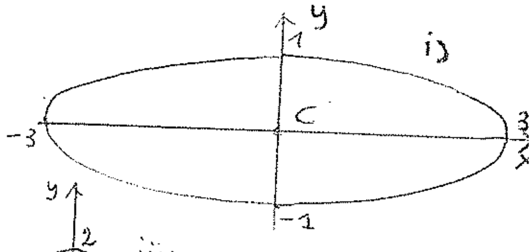
$\begin{cases} 2x^2-2x-4=0 \\ y=3-x^2 \end{cases}$

$\begin{cases} x^2-x-2=0 \\ y=3-x^2 \end{cases}$

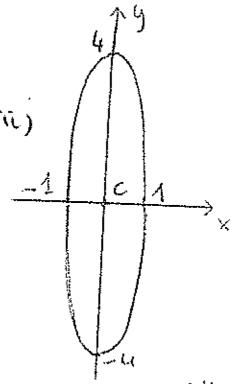
$\begin{cases} x=-1 \text{ o } x=2 \\ y=3-x^2 \end{cases}$ $A(-1,2)$ $B(2,-1)$



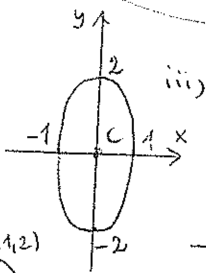
179) i) $C(0,0)$ semiassi $(3,1)$



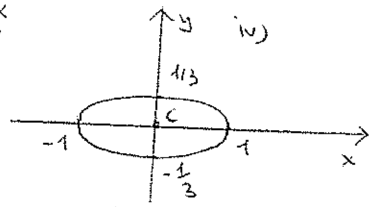
ii) $C(0,0)$ semiassi $(1,4)$



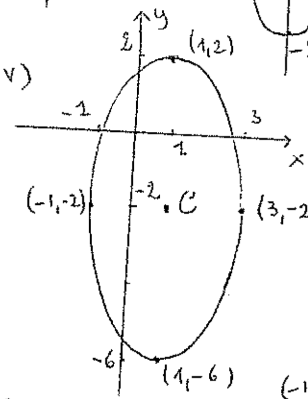
iii) $x^2+\frac{y^2}{4}=1$ $C(0,0)$ sem $(1,2)$



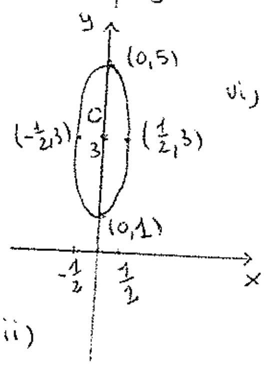
iv) $x^2+\frac{y^2}{\frac{1}{9}}=1$ $C(0,0)$ sem $(1,\frac{1}{3})$



v) $C(1,-2)$ sem. $(2,4)$

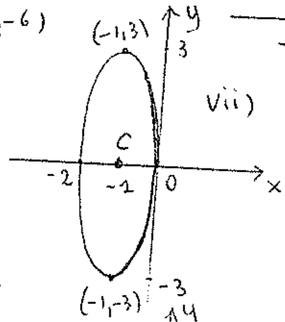


vi) $\frac{x^2}{\frac{1}{4}}+\frac{(y-3)^2}{4}=1$ $C(0,3)$ sem. $(\frac{1}{2},2)$



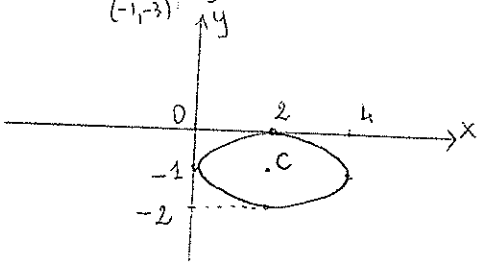
vii) $9(x+1)^2+y^2=9$ $(x+1)^2+\frac{y^2}{9}=1$

$C(-1,0)$ sem. $(1,3)$



viii) $(x-2)^2+4(y+1)^2=4$ $\frac{(x-2)^2}{4}+(y+1)^2=1$

$C(2,-1)$ sem. $(2,1)$



180) i) $\frac{x^2}{4}+\frac{y^2}{9}=1$ ii) $\frac{(x-1)^2}{9}+(y+1)^2=1$

iii) $\frac{(x-2)^2}{16}+\frac{y^2}{4}=1$ iv) $x^2+\frac{y^2}{16}=1$

181) ha $C(0,0)$ semiassi $(5,4)$ $\Rightarrow$ $\frac{x^2}{25}+\frac{y^2}{16}=1$

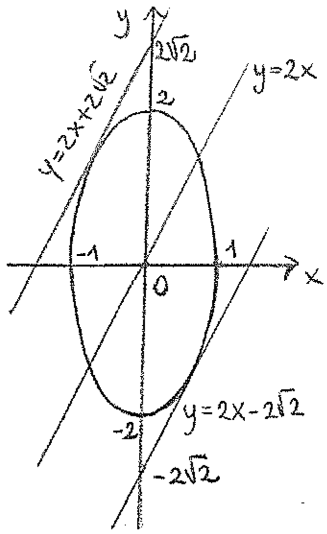
182) $\begin{cases} y=2x+q \\ x^2+\frac{y^2}{4}=1 \end{cases}$ $\begin{cases} \ldots \\ x^2+\frac{1}{4}(2x+q)^2=1 \end{cases}$ $\begin{cases} \ldots \\ 2x^2+xq+\frac{1}{4}q^2-1=0 \end{cases}$ $\Delta=q^2-4\cdot 2\left(\frac{1}{4}q^2-1\right)=$

$=q^2-2q^2+8=8-q^2$

ci sono intersezioni se $8-q^2 \geq 0$

cioè $q^2 \leq 8 \iff -2\sqrt{2} \leq q \leq 2\sqrt{2}$

ELLISSE $C(0,0)$ $a=1$ $b=2$ $y=2x+q$
retta $m=2$



183) la retta è $x=\frac{7}{2}$ che è una retta verticale, quindi il coefficiente angolare non è definito.

184) i) riferita alle bisettrici, per $(1,0)$ e $(-1,0)$

ii) riferita agli assi, per $(1,1)$ e $(-1,-1)$

iii) riferita alle bisettrici per $(0,2)$ e $(0,-2)$ $\quad \frac{y^2}{4}-\frac{x^2}{4}=1$ $\quad a^2=4=b^2$ l'eq.ne si scrive anche $y^2-x^2=b^2$

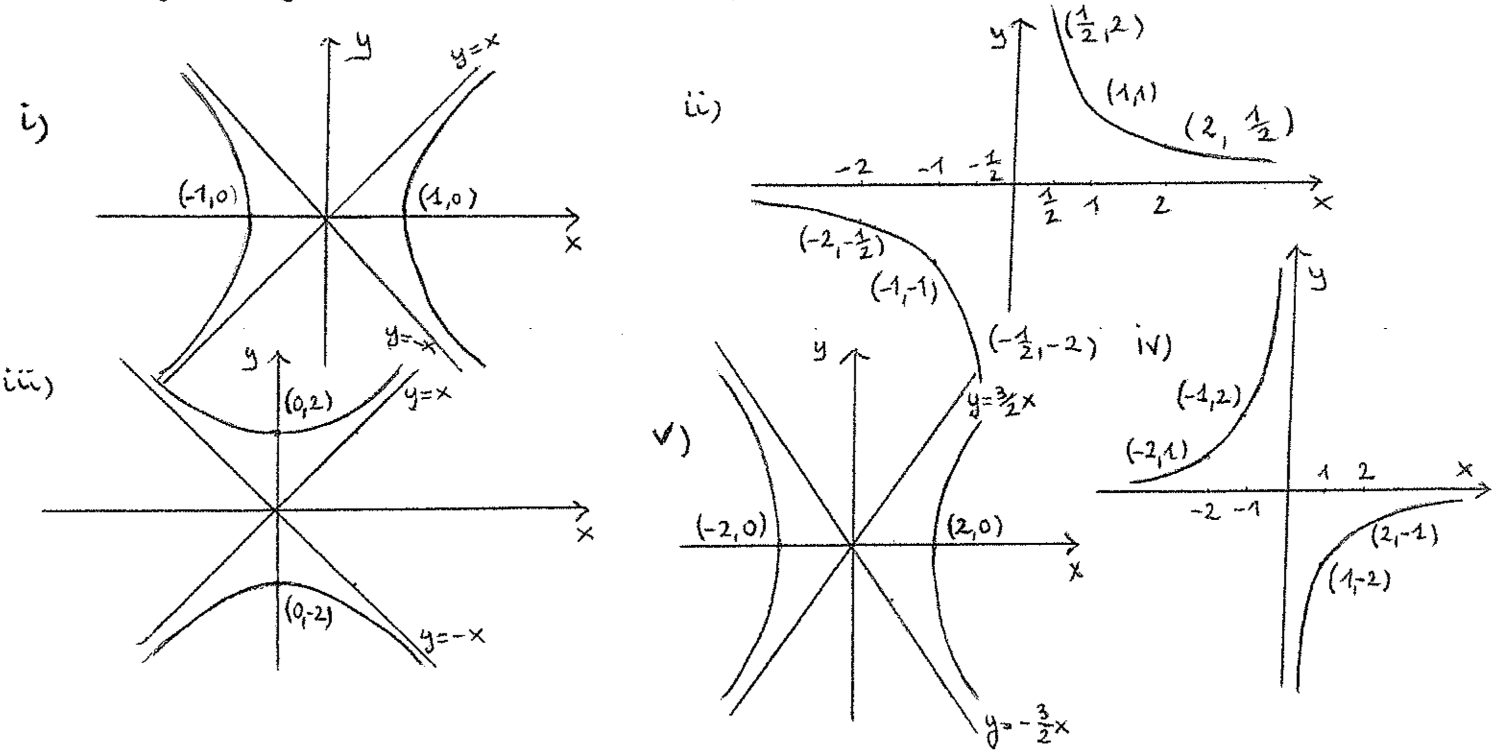
iv) riferita agli assi per $(1,-2)$ e $(-1,2)$

v) riferita a $y=\pm\frac{3}{2}x$ per $(2,0)$ e $(-2,0)$

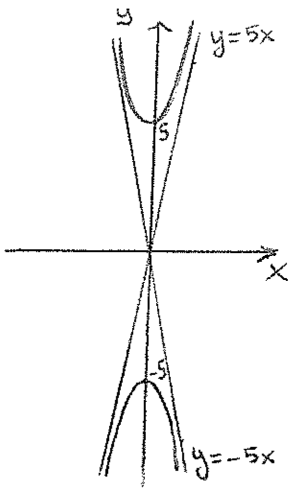
vi) riferita a $y=\pm 5x$ per $(0,5)$ e $(0,-5)$

vii) riferita agli assi per $(2,2)$ e $(-2,-2)$

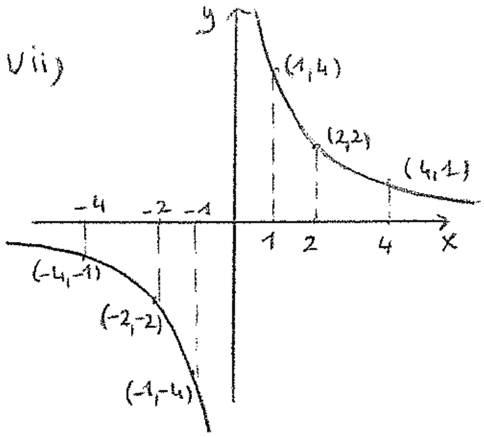
viii) riferita agli assi per $(1,-3)$ e $(-1,3)$ (anche $(3,-1)$ e $(-3,1)$)



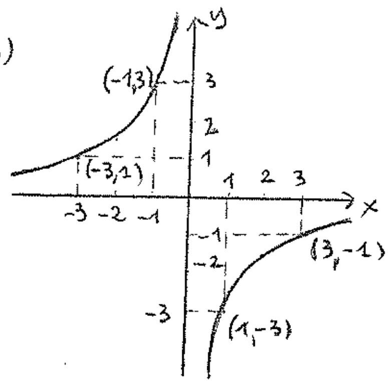
vi)



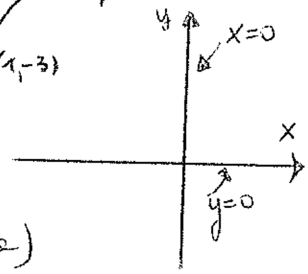
vii)



viii)



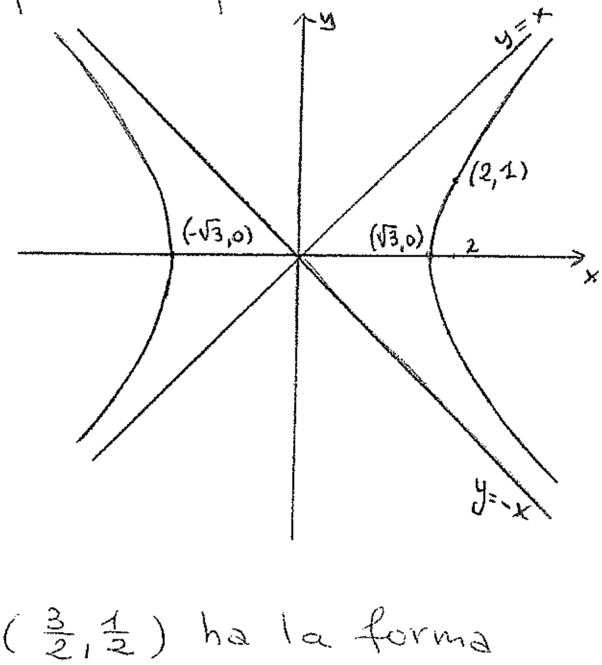
185) $xy=0 \iff x=0$ o $y=0$ quindi si tratta dei due assi cartesiani (e non è un'iperbole)



186) L'iperbole equilatera non è riferita agli assi, bensì alle bisettrici $y=\pm x$. Dovendo passare per $(2,1)$ dev'essere del tipo $x^2-y^2=a^2$, da cui per $x=2$ e $y=1$ si ottiene $4-1=a^2$, $a^2=3$

$$x^2-y^2=3$$

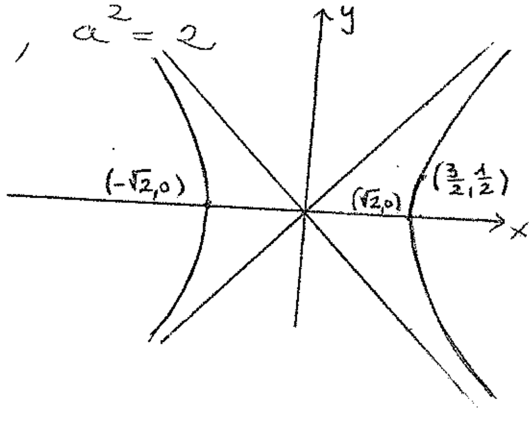
passa per $(\sqrt{3},0)$ e $(-\sqrt{3},0)$



Anche l'iperbole equilatera per $\left(\frac{3}{2},\frac{1}{2}\right)$ ha la forma $x^2-y^2=a^2$, da cui $\frac{9}{4}-\frac{1}{4}=a^2$, $a^2=2$

$x^2-y^2=2$.

(passa per $(\sqrt{2},0)$ e $(-\sqrt{2},0)$)



187) $\begin{cases} y = \frac{1}{2}x + \frac{1}{2} \\ y = -\frac{3}{2}x - 1 \end{cases}$ $\begin{cases} \dots \\ \frac{1}{2}x + \frac{1}{2} = -\frac{3}{2}x - 1 \end{cases}$ $\begin{cases} 2x = -3/2 \\ \dots \end{cases}$ $\begin{cases} x = -\frac{3}{4} \\ y = \frac{1}{8} \end{cases}$

$A\left(-\frac{3}{4}, \frac{1}{8}\right)$

$x^2 - y^2 = a^2$ $\quad \frac{9}{16} - \frac{1}{64} = \frac{36-1}{64} = \frac{35}{64}$

$x^2 - y^2 = \frac{35}{64}$ (passa per $\left(\pm\frac{\sqrt{35}}{8}, 0\right)$)

188) asintoti $y = \pm\frac{5}{2}x$ $\quad b = 5 \quad a = 2 \quad \frac{x^2}{4} - \frac{y^2}{25} = 1$

189) asintoti $y = \pm\frac{4}{3}x$ $\quad b = 4 \quad a = 3 \quad \frac{y^2}{16} - \frac{x^2}{9} = 1$