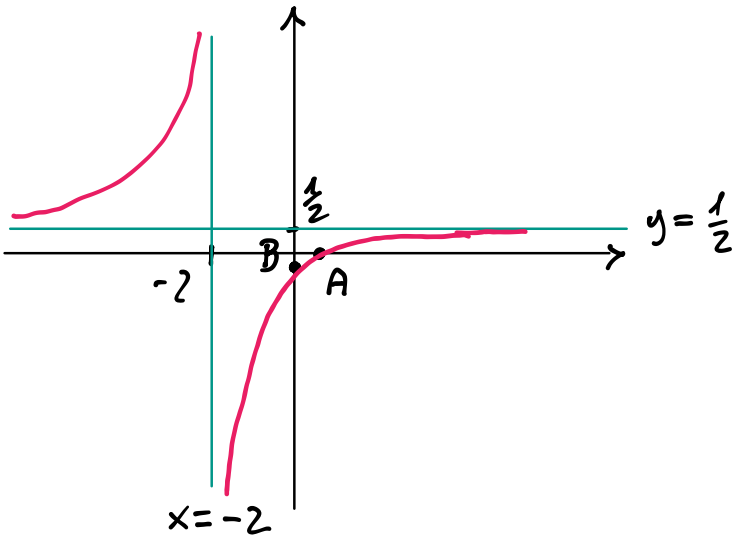
17/5/2018

326 $y = \dfrac{2x-1}{4x+8}$



ASINTOTO VERTICALE

$4x+8=0 \Rightarrow x=-2$

ASINTOTO ORIZZONTALE

$y=\frac{2}{4} \Rightarrow y=\frac{1}{2}$

Quando le intersezioni con gli assi

int. asse x $\begin{cases} y=0 \\ y=\dfrac{2x-1}{4x+8} \end{cases} \Rightarrow 2x-1=0 \Rightarrow x=\frac{1}{2}$

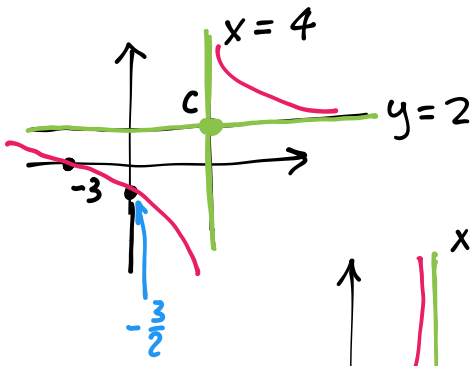
$A\left(\frac{1}{2},0\right)$

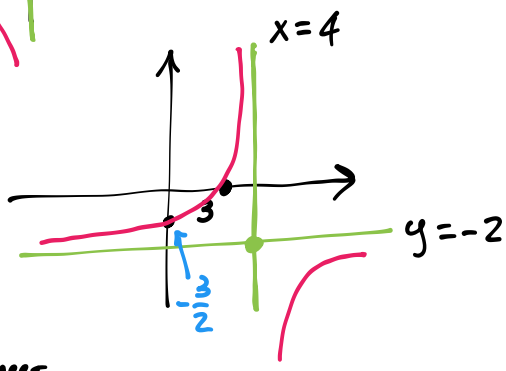
int. asse y $\begin{cases} x=0 \\ y=\dfrac{2x-1}{4x+8}=-\frac{1}{8} \end{cases}$ $B\left(-\frac{1}{8},0\right)$

337 $y = \dfrac{2|x|+6}{x-4}$

Traccia il grafico

$$y = \begin{cases} \dfrac{2x+6}{x-4} & \text{se } x \geq 0 \\ \dfrac{-2x+6}{x-4} & \text{se } x < 0 \end{cases}$$





INT. ASSE x

$\dfrac{2x+6}{x-4} = 0 \Rightarrow 2x+6=0 \Rightarrow x=-3$ $\quad (-3,0)$

INT. ASSE y

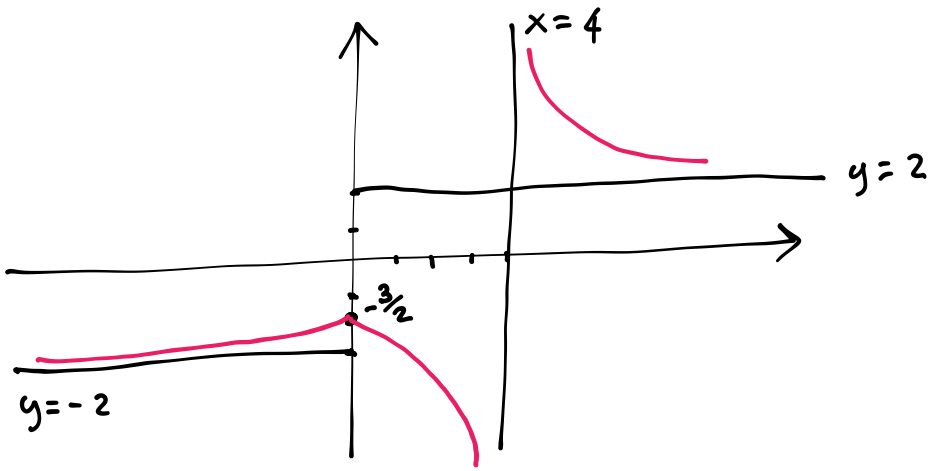
$x=0 \Rightarrow y=-\dfrac{3}{2}$ $\quad \left(0,-\dfrac{3}{2}\right)$

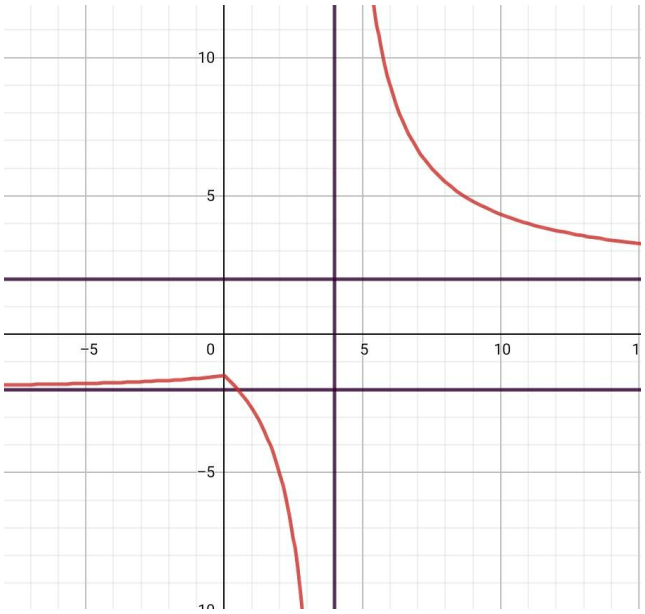
INT. ASSE x

$\dfrac{-2x+6}{x-4} = 0 \Rightarrow x=3$ $\quad (3,0)$

INT. ASSE y

$x=0 \Rightarrow y=-\dfrac{3}{2}$ $\quad \left(0,-\dfrac{3}{2}\right)$





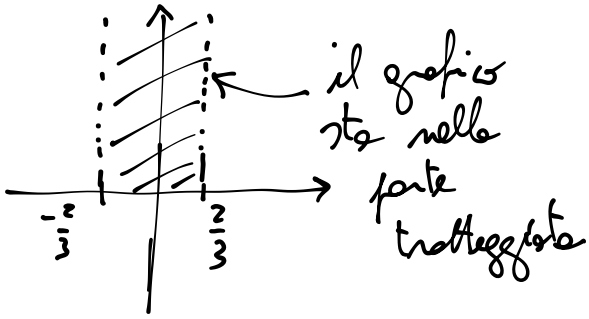
pag. 436

84 $y = \sqrt{4 - 9x^2}$ RAPPRESENTA GRAFICAMENTE

$4 - 9x^2 \geq 0 \qquad 9x^2 \leq 4 \qquad x^2 \leq \frac{4}{9}$

$\Downarrow$

DOMINIO $\qquad -\frac{2}{3} \leq x \leq \frac{2}{3}$



$y \geq 0 \quad \forall x \in$ DOMINIO

$y = \sqrt{4 - 9x^2}$

$\Updownarrow$

$\begin{cases} y^2 = 4 - 9x^2 \rightsquigarrow \text{ellisse} \\ y \geq 0 \end{cases}$

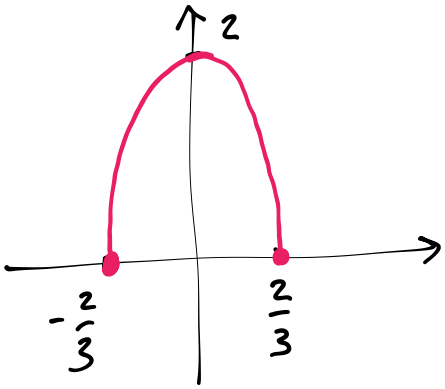
$9x^2 + y^2 = 4$

$\frac{9x^2}{4} + \frac{y^2}{4} = 1$

$\frac{x^2}{\frac{4}{9}} + \frac{y^2}{4} = 1$

$a = \frac{2}{3}$

$b = 2$



95 $y = -5\sqrt{1-x^2}$

$-1 \leq x \leq 1$

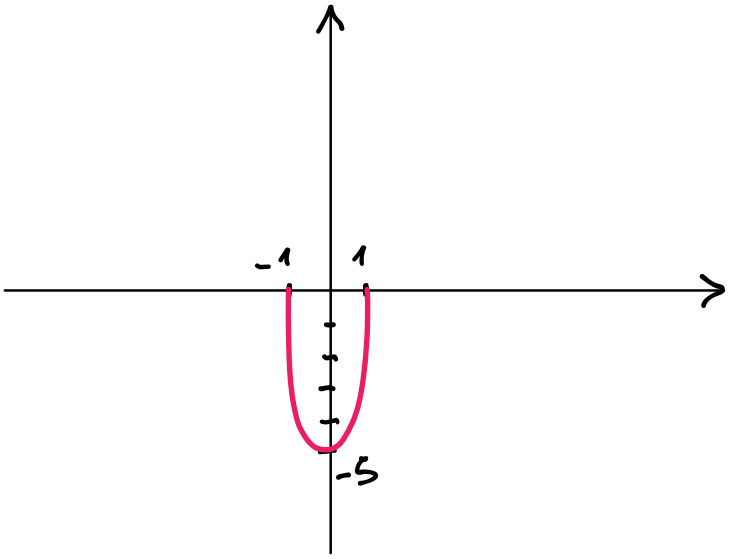
$y \leq 0$

$y^2 = 25(1-x^2)$

$\frac{y^2}{25} = 1 - x^2$

$x^2 + \frac{y^2}{25} = 1$

$a = 1 \quad b = 5$



63 In un piano, riferito a un sistema monometrico di assi cartesiani ortogonali (Oxy), è assegnato il luogo geometrico dei punti che soddisfano la seguente equazione:

$$2xy - (k-1)x + 4y - 2k + 1 = 0,$$

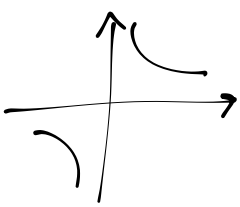
dove k è un parametro reale.

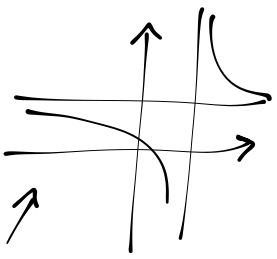
Determinare per quali valori di k il luogo assegnato è:

- un'iperbole;
- una coppia di rette.

(*Esame di Stato di indirizzo scientifico, Scuole italiane all'estero, Sessione ordinaria*, 2001, *quesito* 4)

$xy = c$ ← COSTANTE $\Rightarrow$





FUNZ. OMOGRAFICA

$y = \frac{ax+b}{cx+d}$ $\quad x \neq -\frac{d}{c}$

$y = \frac{ax+b}{cx+d}$

$c \neq 0 \quad ad - bc \neq 0$

$y(cx+d) = ax + b$

$cxy + dy - ax - b = 0$

$2xy - (k-1)x + 4y - 2k + 1 = 0$

$2xy + 4y = (k-1)x + 2k - 1$

$y(2x+4) = (k-1)x + 2k - 1$

$y = \frac{(k-1)x + 2k - 1}{2x + 4}$ $\Rightarrow$ è un'iperbole (funzione omografica) sse $4(k-1) - 2(2k-1) \neq 0$

$4k - 4 - 4k + 2 \neq 0$

$-2 \neq 0$ VERO SEMPRE

$\forall k$ SI HA UN'IPERBOLE (EQUILATERA)

52 Data la curva di equazione $y = \frac{2x - a}{bx + c}$, trova a, b, c, sapendo che ha per asintoto la retta $y = 1$ e per tangente in $A(0; -4)$ la retta $t: y = 5x - 4$. Considera poi la retta passante per il centro di simmetria C e parallela alla bisettrice del secondo e quarto quadrante, determinando la sua intersezione B con la retta t. Calcola l'area del triangolo ABC.

$\left[a = 8, b = 2, c = 2; B\left(\frac{2}{3}; -\frac{2}{3}\right); \text{area} = \frac{10}{3}\right]$

$y = 1 \Rightarrow \frac{2}{b} = 1 \Rightarrow b = 2$

ASINTOTO

$y = \frac{2x - a}{2x + c}$ $\quad A(0, -4)$ PUNTO DELLA CURVA

$-4 = \frac{2 \cdot 0 - a}{2 \cdot 0 + c}$ $\quad -\frac{a}{c} = -4$

$a = 4c$

$\begin{cases} y = \frac{2x - 4c}{2x + c} \\ y = 5x - 4 \end{cases} \Rightarrow 5x - 4 = \frac{2x - 4c}{2x + c}$

$x \neq -\frac{c}{2}$

$x = -\frac{c}{2}$ ASINTOTO VERTICALE

$(2x + c)(5x - 4) = 2x - 4c$

$10x^2 - 8x + 5cx - 4c - 2x + 4c = 0$

$10x^2 - 10x + 5cx = 0$

$2x^2 - 2x + cx = 0$

$2x^2 + (c - 2)x = 0$

PONGO $\Delta = 0 \Rightarrow (c - 2)^2 = 0 \Rightarrow c = 2$

$y = \frac{2x - 8}{2x + 2}$

$\boxed{y = \frac{x - 4}{x + 1}}$

$c = 2$
$a = 8$
$b = 2$