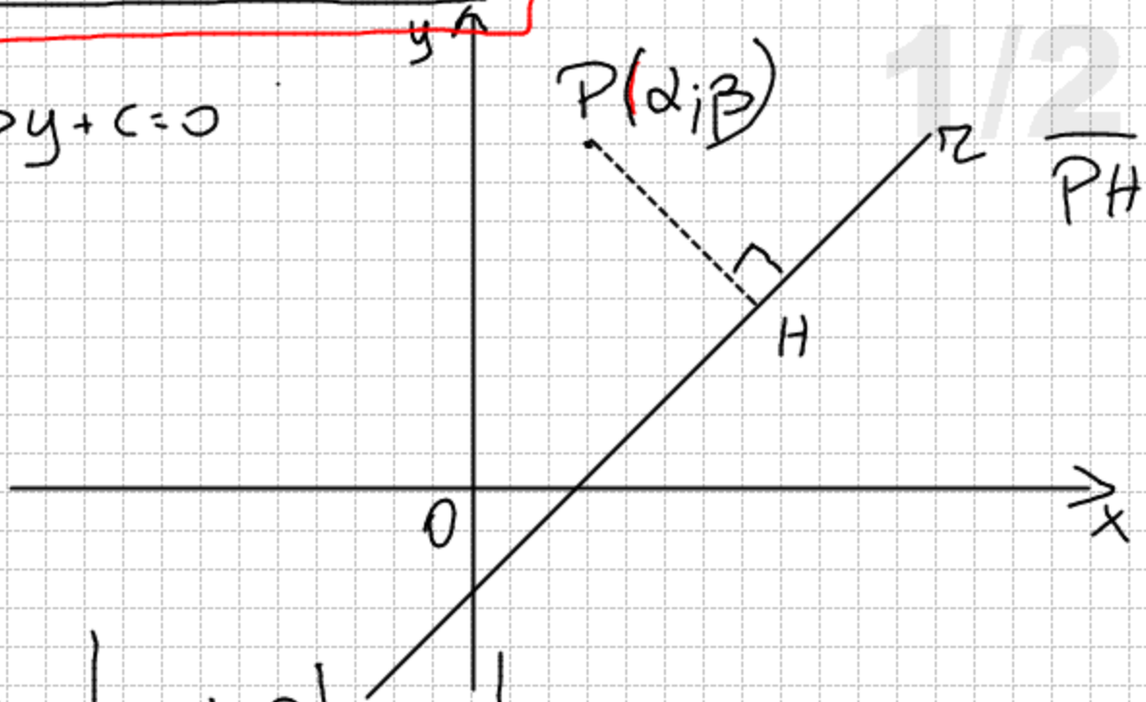
DISTANZA PUNTO RETTA

$r: ax+by+c=0$

$P(\alpha;\beta)$



$\overline{PH} = ?$

$$d(P;r) = \frac{|a\alpha+\beta b+c|}{\sqrt{a^2+b^2}}$$

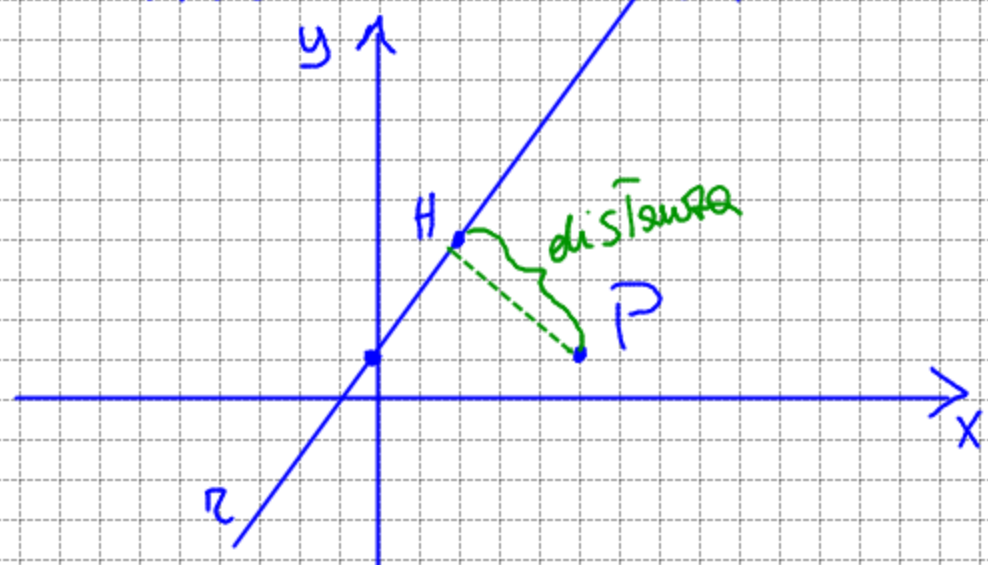
- scrivere eq. retta $\perp r$ e passante per P, $(r_\perp)$
- intersecare la retta r e la retta $r_\perp$ e trovare le coordinate di H.
- distanza di P da H e ho concluso!

ESEMPIO

$r: y = \frac{3}{2}x + 1 \qquad P(5;1)$

Trovare la distanza di P da r.

r	x	y
	0	1
	2	4



$m_r = \frac{3}{2} \qquad m_{PH} = -\frac{2}{3}$

$r_{PH}: \; y - y_P = m_{PH}(x - x_P)$

$y - 1 = -\frac{2}{3}(x - 5)$

$r_{PH}: \; y = -\frac{2}{3}x + \frac{13}{3}$

$H \begin{cases} r_{PH} \\ r \end{cases} \begin{cases} y = -\frac{2}{3}x + \frac{13}{3} \\ y = \frac{3}{2}x + 1 \end{cases}$

$0 = -\frac{13}{6}x + \frac{10}{3}$

$H \begin{cases} x = \frac{20}{13} \\ y = \frac{43}{13} \end{cases} \qquad H\left(\frac{20}{13}; \frac{43}{13}\right) \qquad P(5;1)$

$H \begin{cases} x = \frac{10}{3} \cdot \frac{6}{13} \\ y = \frac{3}{2} \cdot \frac{20}{13} + 1 \end{cases}$

$\overline{PH} = \sqrt{(x_P - x_H)^2 + (y_P - y_H)^2} = \sqrt{\left(5 - \frac{20}{13}\right)^2 + \left(1 - \frac{43}{13}\right)^2}$

$r: \; \underset{a}{2}y \underset{b}{-3}x - 2 = 0 \qquad P(5;1)$

$d(P,r) = \frac{|2(1) - 3(5) - 2|}{\sqrt{4+9}} = \frac{|2 - 15 - 2|}{\sqrt{13}}$

$= \frac{15}{\sqrt{13}}$