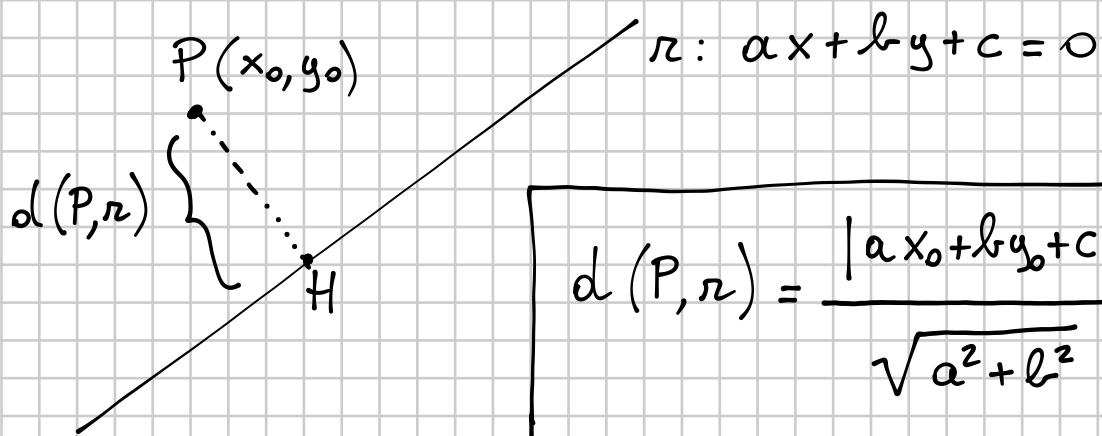


2/2/2021

DISTANZA PUNTO - RETTA



$$d(P, r) = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}}$$

ESEMPIO

$$r: y = -\frac{1}{2}x - \frac{1}{2}$$

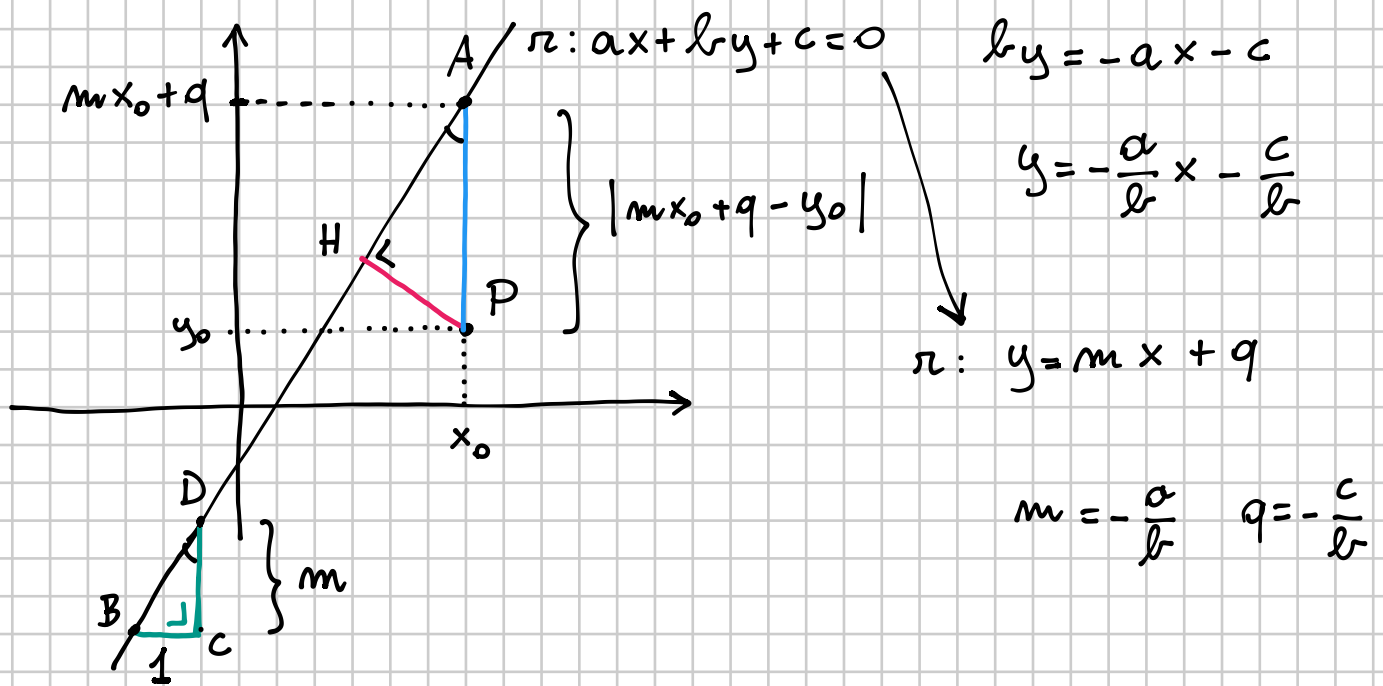
$$P(2, 2)$$

$$\frac{1}{2}x + y + \frac{1}{2} = 0$$

$$x + 2y + 1 = 0$$

$$d(P, r) = \frac{|2 + 2 \cdot 2 + 1|}{\sqrt{1^2 + 2^2}} = \frac{7}{\sqrt{5}}$$

DIMOSTRAZIONE (ROBERTO ZANASI)



3 triangoli BCD e PHA sono simili (angoli congruenti)
perciò hanno i lati corrispondenti in proporzione

$$\overline{PH} : \overline{BC} = \overline{AP} : \overline{BD}$$

$$\overline{PH} = \frac{\overline{BC} \cdot \overline{AP}}{\overline{BD}} = \frac{1 \cdot |mx_0 + q - y_0|}{\sqrt{1^2 + m^2}} =$$

$$\left| \frac{\alpha}{\beta} \right| = \frac{|\alpha|}{|\beta|}$$

CAMBIO
I SEGNI
NEL
MODULO

$$= \frac{\left| -\frac{a}{b}x_0 - \frac{c}{b} - y_0 \right|}{\sqrt{1 + \frac{a^2}{b^2}}} = \frac{\left| \frac{ax_0 + by_0 + c}{b} \right|}{\sqrt{\frac{a^2 + b^2}{b^2}}} = \frac{\frac{1}{|b|} |ax_0 + by_0 + c|}{\frac{1}{|b|} \sqrt{a^2 + b^2}} = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}}$$

$\sqrt{\alpha^2} = |\alpha|$

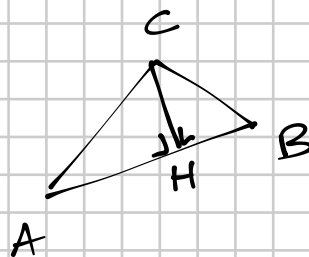
Questo se $b \neq 0$; se $b = 0$ la formula vale comunque.

CVD

Determino l'area del triangolo

440 $A(-1, 2)$ $B(0, 3)$ $C(4, -1)$

base AB



$$\overline{AB} = \sqrt{(-1-0)^2 + (2-3)^2} = \sqrt{2}$$

$$\overline{CH} = d(C, \text{retta } AB) \quad \text{eq. retta } AB$$

$$\frac{y-2}{3-2} = \frac{x+1}{0+1}$$

$$y-2 = x+1 \quad x-y+3=0$$

$$\overline{CH} = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}} = \frac{|4 - (-1) + 3|}{\sqrt{1^2 + (-1)^2}} = \frac{8}{\sqrt{2}}$$

$$A = \frac{1}{2} \overline{AB} \cdot \overline{CH} = \frac{1}{2} \cancel{\sqrt{2}} \cdot \frac{8}{\cancel{\sqrt{2}}} = \frac{8}{2} = 4$$

RIPASSO DISEQUAZIONI

122 $x^3 + 5x^2 - 6x < 0$

$[x < -6 \vee 0 < x < 1]$

$$x(x^2 + 5x - 6) < 0$$

$$\overset{(1)}{x} \overset{(2)}{(x+6)} \overset{(3)}{(x-1)} < 0$$

(1) $x > 0$

(2) $x+6 > 0 \quad x > -6$

(3) $x-1 > 0 \quad x > 1$

	-6		0		1	
-	-	-	0	+	+	
-	0	+		+	+	
-	-	-	-	0	+	
-	0	+	0	-	0	+

$$x < -6 \vee 0 < x < 1$$

118 $x^2 - x + 3 < x + 2$

[Impossibile]

$$x^2 - 2x + 1 < 0$$

$(x-1)^2 < 0$ Già si vede che è impossibile perché un quadrato non può essere minore di 0

Se andiamo avanti

$$\overset{(1)}{(x-1)} \overset{(2)}{(x-1)} < 0$$

(1) $x-1 > 0 \quad x > 1$

(2) $x-1 > 0 \quad x > 1$

	1	
-	0	+
-	0	+
+	0	+

$S = \emptyset$

perché non ci sono simboli -

123 $x^3 - 4x^2 + 4x \geq 0$

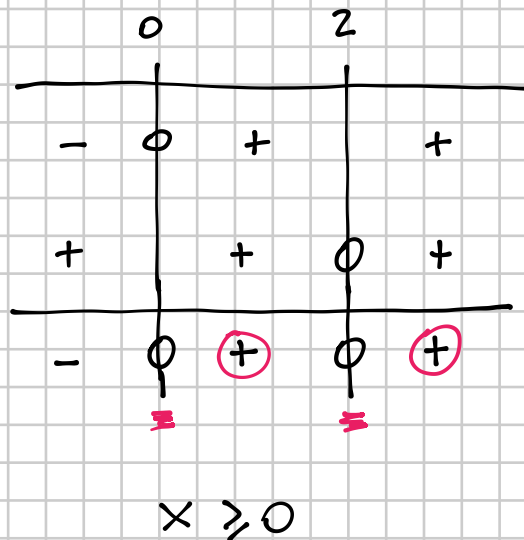
$[x \geq 0]$

$$x(x^2 - 4x + 4) \geq 0$$

$$\overset{\textcircled{1}}{x} \overset{\textcircled{2}}{(x-2)^2} \geq 0$$

$\textcircled{1} \quad x > 0$

$\textcircled{2} \quad (x-2)^2 > 0 \quad \forall x \neq 2$



152 $\frac{1}{2x+4} - \frac{1}{2-x} \geq -\frac{x+4}{2x+4}$

$[x \leq -6 \vee -2 < x \leq 1 \vee x > 2]$

$$\frac{1}{2(x+2)} + \frac{1}{x-2} + \frac{x+4}{2(x+2)} \geq 0$$

$$\frac{x-2 + 2(x+2) + (x+4)(x-2)}{2(x+2)(x-2)} \geq 0$$

$$\frac{x-2 + \cancel{2x} + 4 + x^2 - \cancel{2x} + 4x - 8}{(x+2)(x-2)} \geq 0$$

$$\frac{x^2 + 5x - 6}{(x+2)(x-2)} \geq 0$$

$$\frac{x^2 + 5x - 6}{(x+2)(x-2)} \geq 0$$

$$\frac{\overset{(1)}{(x+6)} \overset{(2)}{(x-1)}}{\overset{(3)}{(x+2)} \overset{(4)}{(x-2)}} \geq 0$$

$$(1) \quad x+6 > 0 \quad x > -6$$

$$(2) \quad x-1 > 0 \quad x > 1$$

$$(3) \quad x+2 > 0 \quad x > -2$$

$$(4) \quad x-2 > 0 \quad x > 2$$

	-6		-2		1		2
	-	0	+		+		+
	-		-		-	0	+
	-		-	+	+		+
	-		-		-		-
	-		-		-	+	+
	+	0	-	+	+	0	-
	+	0	-	+	+	0	-
	+	0	-	+	+	0	-
	+	0	-	+	+	0	-

$$x \leq -6 \quad \vee \quad -2 < x \leq 1 \quad \vee \quad x > 2$$

165

$$\begin{cases} \textcircled{1} -\frac{x}{2} \geq -\frac{1}{3} \\ \textcircled{2} x - 3 \leq 0 \\ \textcircled{3} 1 < \frac{1}{1-x} \end{cases}$$

$$\left[0 < x \leq \frac{2}{3} \right]$$

$$\textcircled{1} -\frac{x}{2} \geq -\frac{1}{3} \quad \frac{x}{2} \leq \frac{1}{3} \quad x \leq \frac{2}{3}$$

$$\textcircled{2} x - 3 \leq 0 \quad x \leq 3$$

$$\textcircled{3} 1 < \frac{1}{1-x} \quad 1 - \frac{1}{1-x} < 0 \quad \frac{1-x-1}{1-x} < 0$$

$$-\frac{x}{1-x} < 0 \quad \frac{x}{1-x} > 0$$

CAMBIO SEÑO

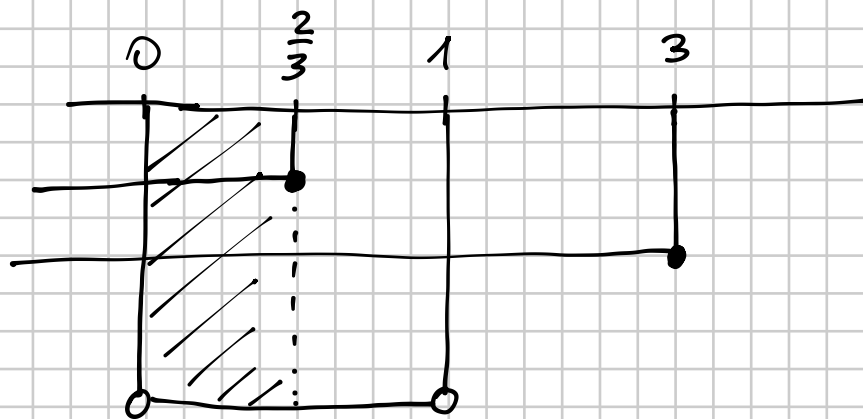
$$\textcircled{N} x > 0$$

$$\textcircled{D} 1-x > 0 \quad -x > -1 \quad x < 1$$

	0	1	
-	0	+	+
+		+	-
-	0	+	-

$0 < x < 1$

$$\begin{cases} \textcircled{1} x \leq \frac{2}{3} \\ \textcircled{2} x \leq 3 \\ \textcircled{3} 0 < x < 1 \end{cases}$$



$$\boxed{0 < x \leq \frac{2}{3}}$$