

ES 47

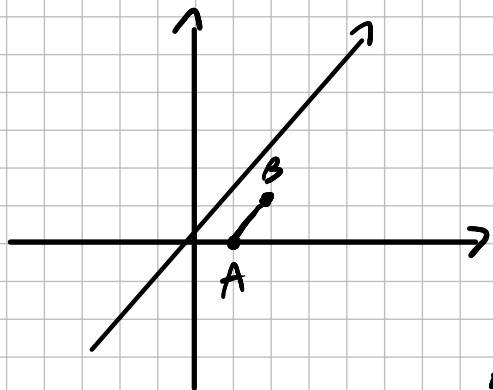
$$A \equiv (1, 0, 0) \quad B \equiv (1, 0, -1)$$

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

PUNTO

$$C \in \mathbb{R} : A(\triangle ABC) = \frac{3}{2}$$

$$\hookrightarrow \begin{cases} x = y - 2 \\ z = y + 1 \end{cases}$$



$$C \equiv (y-2, y, y+1)$$

GENERIC PUNTO DI  $y$

$$\vec{AB} = (0, 0, -1)$$

$$\vec{AC} = (y-1, y, y+1)$$

$$A_{\triangle ABC} = \frac{3}{2} = \frac{1}{2!} \sqrt{\det \begin{pmatrix} \langle \vec{AB}, \vec{AB} \rangle & \langle \vec{AB}, \vec{AC} \rangle \\ \langle \vec{AB}, \vec{AC} \rangle & \langle \vec{AC}, \vec{AC} \rangle \end{pmatrix}} =$$

$$= \frac{1}{2} \sqrt{\begin{vmatrix} 1 & -y-1 \\ -y-1 & 3y^2-4y+10 \end{vmatrix}} \rightarrow \frac{1}{2} \sqrt{3y^2-4y+10 - (y+1)^2}$$

$$= \frac{1}{2} \sqrt{2y^2-6y+9} = \frac{3}{2} \Rightarrow \sqrt{2y^2-6y+9} = 3$$

$$2y^2-6y+9 = 9$$

$$y(2y-6) = 0$$

$$\begin{cases} y=0 \\ y=3 \end{cases}$$

$$L_1 \Rightarrow y=0 \Rightarrow (-2, 0, 1)$$

$$L_2 \Rightarrow y=3 \Rightarrow (1, 3, 4)$$

ES 49

o)  $P \equiv (0, 0, 1)$  e  $Q \equiv (0, 1, 0)$

$$r: \begin{cases} x = 3k \\ y = 2k \\ z = k \end{cases}$$

$$r': \begin{cases} x = 2s - 1 \\ y = -s \\ z = 1 - 2s \end{cases}$$

$$\vec{r} = (3, 2, 1)$$

$$\vec{r}' = (2, -1, -2)$$

$$r \cap r' \rightarrow \begin{cases} x = 3z \\ y = 2z \\ x = -2y - 1 \\ z = 1 + 2y \end{cases}$$

RISOLVO E TROVO CHE È IMPOSS  $r \cap r' = \emptyset$

PIANO  $\pi$  PER  $r$  e  $r'$

$$\lambda(x - 3z) + \mu(y - 2z) = 0$$

$$\parallel r' \rightarrow \lambda(2 + 6) + \mu(-1 + 4) = 0 \rightarrow \begin{matrix} \lambda = 3 \\ \mu = -8 \end{matrix}$$

$$d(r, r') = d(r', \pi) = d(P \in r', \pi) = \frac{|3(-1) - 8(0) + 7(1)|}{\sqrt{3^2 + 64 + 49}} = \frac{4}{\sqrt{122}}$$

b)

$$\vec{r}'' = (0, 1, -1) \quad (\text{COMPONENTI } \vec{PQ})$$

DIREZIONE RETTA PER

$$M = (3k, 2k, k) \text{ e } N(2s - 1, -s, 1 - 2s)$$

$$\vec{MN} = (2s - 1 - 3k, -s - 2k, 1 - 2s - k)$$

DEVONO ESSERE PROPORZIONALI

$$\begin{cases} 2s - 3k - 1 = 0 \\ -s - 2k + 1 - 2s - k = 0 \end{cases} \rightarrow \begin{cases} 2s - 3k = 1 \\ -3s - 3k = -1 \end{cases}$$

$$S = \frac{\begin{vmatrix} 1 & -3 \\ -1 & -3 \end{vmatrix}}{\begin{vmatrix} 2 & -3 \\ -3 & -3 \end{vmatrix}} = \frac{-6}{-15} = \frac{2}{5}$$

$$T = \frac{\begin{vmatrix} 2 & 1 \\ -3 & -1 \end{vmatrix}}{-15} = \frac{-2+3}{-15} = -\frac{1}{15}$$

$$M = \left(-\frac{1}{5}, -\frac{2}{15}, -\frac{1}{15}\right) \quad \text{e} \quad N = \left(-\frac{1}{5}, -\frac{2}{5}, \frac{1}{5}\right)$$

RETTA CERCATA È QUELLA CONTENENTE MN

$$\begin{vmatrix} x + \frac{1}{5} & 0 \\ y + \frac{2}{5} & -\frac{4}{15} \\ z + \frac{1}{15} & \frac{4}{15} \end{vmatrix} = 1 \quad \Rightarrow \quad \begin{cases} x + \frac{1}{5} = 0 \\ y + z + \frac{1}{5} = 0 \end{cases}$$