

SCRIVERE LE EQUAZIONI DELLA RETTA
PASSANTE PER L'ORIGINE $O(0;0;0)$ E CHE SI
APPOGGIA ALLE SEGUENTI RETTE $\pi: y = 4x - y - 5z - 19 = 0$
ED $\Delta: x - 3y + 2z - 17 = 2y + z = 0$

- 1) FASCIO DI PIANI PER π + PASSAGGIO PER $O(0;0;0)$
- 2) FASCIO DI PIANI PER Δ + PASSAGGIO PER $O(0;0;0)$

LA RETTA IN QUESTIONE È L'INTERSEZIONE DEI 2 PIANI

$$\pi: \begin{cases} y = 0 \\ 4x - y - 5z - 19 = 0 \end{cases}$$

FASCIO $\lambda \cdot y + \mu (4x - y - 5z - 19) = 0$
PASSAGGIO PER $O(0,0,0)$

$$0 + \mu (0 - 0 - 0 - 19) = 0$$

$$-19\mu = 0 \Rightarrow \mu = 0$$

FASCIO $\lambda \cdot y + 0 (4x - y - 5z - 19) = 0$

$$\lambda y = 0 \quad (: \lambda) \quad \pi: y = 0$$

$$\Delta: \begin{cases} x - 3y + 2z - 17 = 0 \\ 2y + z = 0 \end{cases}$$

FASCIO $\lambda (x - 3y + 2z - 17) + \mu (2y + z) = 0$
PASSAGGIO $O(0,0,0)$

$$-17\lambda = 0 \quad \lambda = 0$$

FASCIO $0(x - 3y + 2z - 17) + \mu (2y + z) = 0 \quad (: \mu)$
 $\pi_1: 2y + z = 0$

LA RETTA RICHIESTA È $t: \begin{cases} \pi \\ \pi_1 \end{cases} \quad \begin{cases} y = 0 \\ 2y + z = 0 \end{cases}$

$$\begin{cases} y = 0 \\ z = 0 \end{cases} \quad \text{ASSE } x$$

TROVA IL PIANO π PASSANTE PER $A(8; 10; \sqrt{11})$ E
 $\parallel$ AD $\pi: y + 2z - 12 = x - 3z + 1 = 0$ E $\perp$ AL PIANO $3x - 2y + 8 = 0$

PASSA PER A $\rightarrow$ STELLA $a(x - x_A) + b(y - y_A) + c(z - z_A) = 0$
 $a(x - 8) + b(y - 10) + c(z - \sqrt{11}) = 0$

$\pi \rightarrow \parallel \pi \quad al + bm + cn = 0 \quad a, b, c \in \pi$
 $l, m, n \in \pi$

$\pi \perp \pi'$

$$aa' + bb' + cc' = 0$$

$$a, b, c \in \pi$$

$$a', b', c' \in \pi': 3x - 2y + 8 = 0$$

$$\begin{aligned} a' &= 3 \\ b' &= -2 \\ c' &= 0 \quad (\text{NON HO } z) \end{aligned}$$

$$3a - 2b = 0$$

A SISTEMA

$$\begin{cases} 3a - 2b = 0 \\ -3a + 2b - c = 0 \end{cases}$$

$$\begin{array}{r} \hline // \quad // \quad -c = 0 \\ c = 0 \end{array} \quad \text{Somma}$$

$$\begin{cases} 3a - 2b = 0 & a = \frac{2}{3}b \\ c = 0 & c = 0 \end{cases}$$

$$a(x - 8) + b(y - 10) + c(z - \sqrt{11}) = 0$$

$$\downarrow \quad \downarrow \quad \downarrow$$

$$\frac{2}{3}b(x - 8) + b(y - 10) + c = 0 \quad c = 0 \quad = 0$$

$$\frac{2}{3}b(x - 8) + b(y - 10) = 0 \quad (:b)$$

$$\frac{2}{3}(x-8) + (y-10) = 0 \rightarrow \frac{2}{3}x - \frac{16}{3} + y - 10 = 0 \text{ m.c.m.}$$

$$\pi: 2x + 3y - 46 = 0$$

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TROVA LA DISTANZA TRA LE 2 RETTE

$$r: x - 2y = y - 3z = 0$$

$$s: x - 2y + 1 = y - 3z + 1 = 0$$

PARALLELI

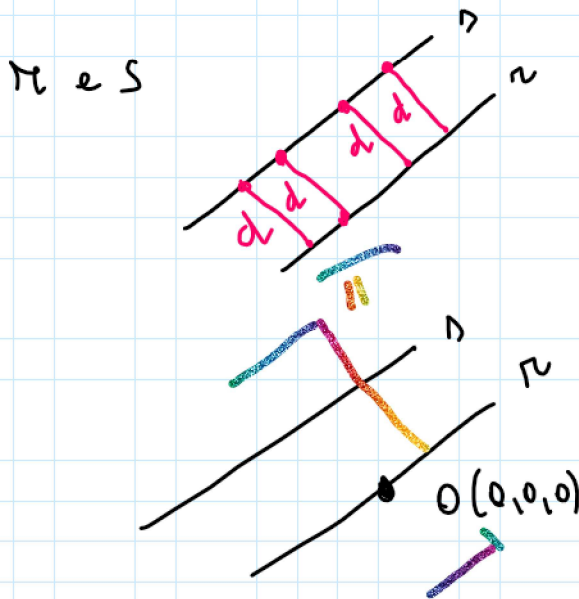
$$r: \begin{cases} x - 2y = 0 \\ y - 3z = 0 \end{cases}$$

PARALLELI

PASSA PER $O(0,0,0)$

$$s: \begin{cases} x - 2y + 1 = 0 \\ y - 3z + 1 = 0 \end{cases}$$

NON PASSA PER $O(0,0,0)$



$d = ?$

PASSA PER $O(0,0,0) \rightarrow$ STELLA
 $\begin{cases} a = l \\ b = m \\ c = n \end{cases} \text{ da } \begin{cases} \perp \\ \rightarrow \end{cases}$

$$\pi: a(x-0) + b(y-0) + c(z-0) = 0$$

$$s: \begin{cases} x - 2y + 1 = 0 \\ y - 3z + 1 = 0 \end{cases}$$

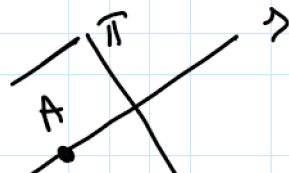
$$\begin{pmatrix} l & m & n \\ 1 & -2 & 0 \\ 0 & 1 & -3 \end{pmatrix}$$

$$l = \begin{vmatrix} -2 & 0 \\ 1 & -3 \end{vmatrix} = 6 = a$$

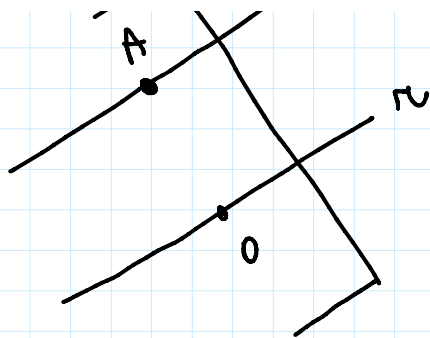
$$m = - \begin{vmatrix} 1 & 0 \\ 0 & -3 \end{vmatrix} = 3 = b$$

$$n = \begin{vmatrix} 1 & -2 \\ 0 & 1 \end{vmatrix} = 1 = c$$

$$\pi: 6x + 3y + z = 0$$



$$d = \left| \frac{Ax + By + Cz + D}{\sqrt{A^2 + B^2 + C^2}} \right|$$



$$A = \begin{cases} \pi \\ \Delta \end{cases} \text{ distanza } \overline{OA}$$

$$\pi \begin{cases} 6x + 3y + z = 0 \\ x - 2y + 1 = 0 \\ \Delta \begin{cases} y - 3z + 1 = 0 \end{cases} \end{cases}$$

SOSTITUZIONE

$$\begin{cases} 6x + 3(3z - 1) + z = 0 \\ x - 2(3z - 1) + 1 = 0 \\ y = 3z - 1 \end{cases} \rightarrow \begin{cases} 6x + 9z - 3 + z = 0 \\ x - 6z + 3 = 0 \end{cases} \rightarrow \begin{cases} 6x + 10z - 3 = 0 \\ x - 6z + 3 = 0 \\ y = 3z - 1 \end{cases}$$

SOSTITUZIONE

$$\begin{cases} 6(6z - 3) + 10z - 3 = 0 \rightarrow 36z - 18 + 10z - 3 = 0 \quad 46z = 21 \quad z = \frac{21}{46} \\ x = 6z - 3 \\ y = 3z - 1 \end{cases}$$

$$x = 3 \cdot \frac{21}{46} - 3 = \frac{63}{46} - 3 = \frac{63 - 138}{46} = -\frac{75}{46}$$

$$y = 3 \cdot \frac{21}{46} - 1 = \frac{63}{46} - 1 = \frac{63 - 46}{46} = \frac{17}{46}$$

$$A \left(-\frac{75}{46}, \frac{17}{46}, \frac{21}{46} \right)$$

$$d = \overline{OA} = \sqrt{(x_A - x_0)^2 + (y_A - y_0)^2 + (z_A - z_0)^2}$$

$$\sqrt{\left(-\frac{75}{46}\right)^2 + \left(\frac{17}{46}\right)^2 + \left(\frac{21}{46}\right)^2}$$