

1. Consideriamo i seguenti punti nello spazio

$$A = (0, 0, 1)$$

$$B = (0, 2, 0)$$

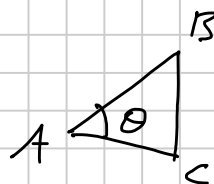
$$C = (-1, 2, 3)$$

$$D = (0, 1, 1).$$

(a) Determinare il volume del tetraedro  $ABCD$ .

(b) Determinare l'angolo che la faccia  $ABC$  forma con la faccia  $ABD$ .

Q) AREA TRIANGOLO  $\triangle ABC$



$$\text{LATO } AB : B - A = (0, 2, -1)$$

$$\text{LATO } AC : C - A = (-1, 2, 2)$$

$$\cos \theta = \frac{0+4-2}{\sqrt{5} \cdot \sqrt{9}} = \frac{2}{3\sqrt{5}} \quad \sin \theta = \sqrt{1 - \frac{4}{45}} = \sqrt{\frac{41}{45}} = \frac{\sqrt{41}}{3\sqrt{5}}$$

$$\text{AREA } \triangle ABC = \frac{1}{2} |AB| |AC| \sin \theta = \frac{1}{2} \sqrt{5} \cdot 3 \frac{\sqrt{41}}{3\sqrt{5}} = \frac{\sqrt{41}}{2}$$

PIANO PASSANTE PER ABC

$$M = \begin{vmatrix} l_1 & l_2 & l_3 \\ 0 & 2 & -1 \\ -1 & 2 & 2 \end{vmatrix} = (6, -1, 2) \Rightarrow 6x - y + 2z + d = 0$$

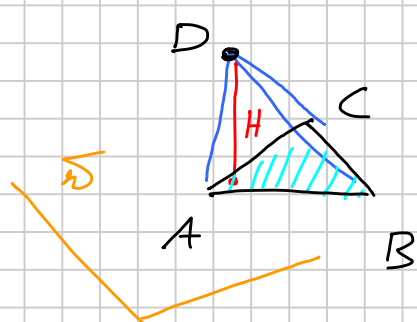
$$A \in \text{PIANO} \Rightarrow 2 + d = 0 \quad d = -2$$

$$6x - y + 2z - 2 = 0$$

DISTANZA DEL PUNTO D DAL PIANO

$$DIST = \frac{|6x_0 + b y_0 + c z_0 + d|}{\sqrt{a^2 + b^2 + c^2}} = \frac{|6 \cdot 0 - 1 \cdot 1 + 2 \cdot 1 - 2|}{\sqrt{36 + 1 + 4}} = \frac{1}{\sqrt{41}}$$

VOLUME DEL TETRAEDRO



$$V = \frac{1}{3} \text{AREA } \triangle ABC \cdot H = \frac{1}{3} \frac{\sqrt{41}}{2} \frac{1}{\sqrt{41}} = \frac{1}{6}$$

FORMULA VALIDA PER "CONI"  
QUALSIASI  $A(z) = \frac{A_0}{H^2} (H-z)^2$