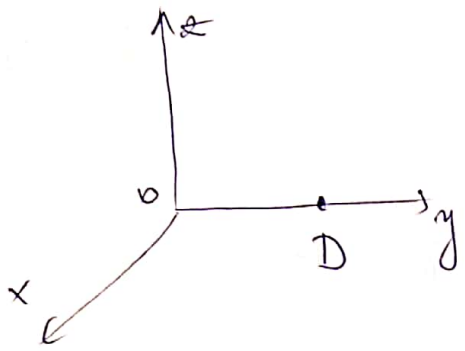
(33.) ABCD tetraéder: $A(2,1,-1)$, $B(3,0,1)$, $C(2,-1,3)$

Határozzuk meg a D koordinátáit, ha $V(ABCD)=5$, $D \in Oy$.



$D \in Oy \Rightarrow D(0, d, 0)$.

$V(ABCD) = \frac{1}{6} \cdot |(\overrightarrow{AB}, \overrightarrow{AC}, \overrightarrow{AD})| =$

$$= \frac{1}{6} \cdot 1 \begin{vmatrix} 1 & -1 & 2 \\ 0 & -2 & 4 \\ -2 & d-1 & 1 \end{vmatrix} | =$$

$$= \frac{1}{6} \cdot | -2 + 8 - 8 - 4(d-1) | =$$

$$= \frac{1}{6} \cdot | -4d + 2 | = 5 \iff | 4d + 2 | = 30$$

$$\iff 4d + 2 = \pm 30$$

$4d + 2 = 30$ v. $4d + 2 = -30$

$d_1 = 7$ $\qquad$ $d_2 = -8$

$\Rightarrow D_1(0, 7, 0)$

$D_2(0, -8, 0)$.