

Übung 1 (R₁)

$$\begin{aligned}\vec{BC} &= (7-3)\vec{i} + (-5-(-3))\vec{j} \\ &= 4\vec{i} - 2\vec{j} \\ &= \begin{pmatrix} 4 \\ -2 \end{pmatrix}\end{aligned}$$

$$\begin{aligned}\vec{DE} &= (x_E - x_D)\vec{i} + (y_E - y_D)\vec{j} \\ &= (-5 - (-3))\vec{i} + (2 - (-2))\vec{j} \\ &= -2\vec{i} + 4\vec{j} \\ &= \begin{pmatrix} -2 \\ 4 \end{pmatrix}\end{aligned}$$

$$\vec{CB} = \begin{pmatrix} -4 \\ 2 \end{pmatrix} = -4\vec{i} + 2\vec{j}$$

$$\vec{ED} = \begin{pmatrix} 2 \\ -4 \end{pmatrix} = 2\vec{i} - 4\vec{j}$$

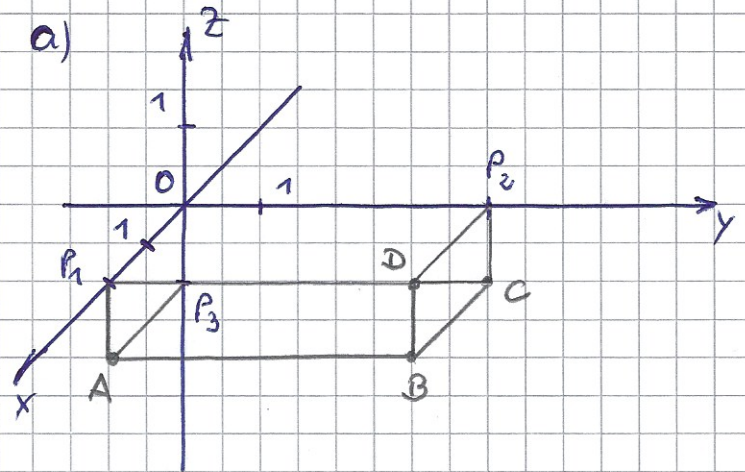
$$\vec{AB} = \begin{pmatrix} 0 \\ -7 \end{pmatrix} = -7\vec{j}$$

$$\vec{CA} = \begin{pmatrix} -4 \\ 9 \end{pmatrix} = -4\vec{i} + 9\vec{j}$$

$$\vec{BD} = \begin{pmatrix} -6 \\ 1 \end{pmatrix} = -6\vec{i} + \vec{j}$$

$$\vec{EB} = \begin{pmatrix} 8 \\ -5 \end{pmatrix} = 8\vec{i} - 5\vec{j}$$

Übung 2 (R₃)



Fortleitung der Eckpunkte nach
Regeln der Berechnung von Körpern:

- von unten nach oben
- entgegen Uhrzeigersichtung

b) A(2|0|-1); B(2|4|-1); C(0|4|-1); D(2|4|0)

$$\begin{aligned}\vec{OD} &= x_D\vec{i} + y_D\vec{j} + z_D\vec{k} \quad (\text{Ordnung}) \\ &= 2\vec{i} + 4\vec{j} + 0\vec{k} \\ &= \begin{pmatrix} 2 \\ 4 \\ 0 \end{pmatrix}\end{aligned}$$

$$\begin{aligned}\vec{OP}_1 &= x_P\vec{i} + y_P\vec{j} + z_P\vec{k} \\ &= 2\vec{i} + 0\vec{j} + 0\vec{k} \\ &= \begin{pmatrix} 2 \\ 0 \\ 0 \end{pmatrix}\end{aligned}$$

$$\vec{OP}_2 = 0\vec{i} + 4\vec{j} + 0\vec{k} = \begin{pmatrix} 0 \\ 4 \\ 0 \end{pmatrix}$$

$$\vec{OP}_3 = 0\vec{i} + 0\vec{j} - 1\vec{k} = \begin{pmatrix} 0 \\ 0 \\ -1 \end{pmatrix}$$

$$\vec{AB} = (x_B - x_A)\vec{i} + (y_B - y_A)\vec{j} + (z_B - z_A)\vec{k}$$

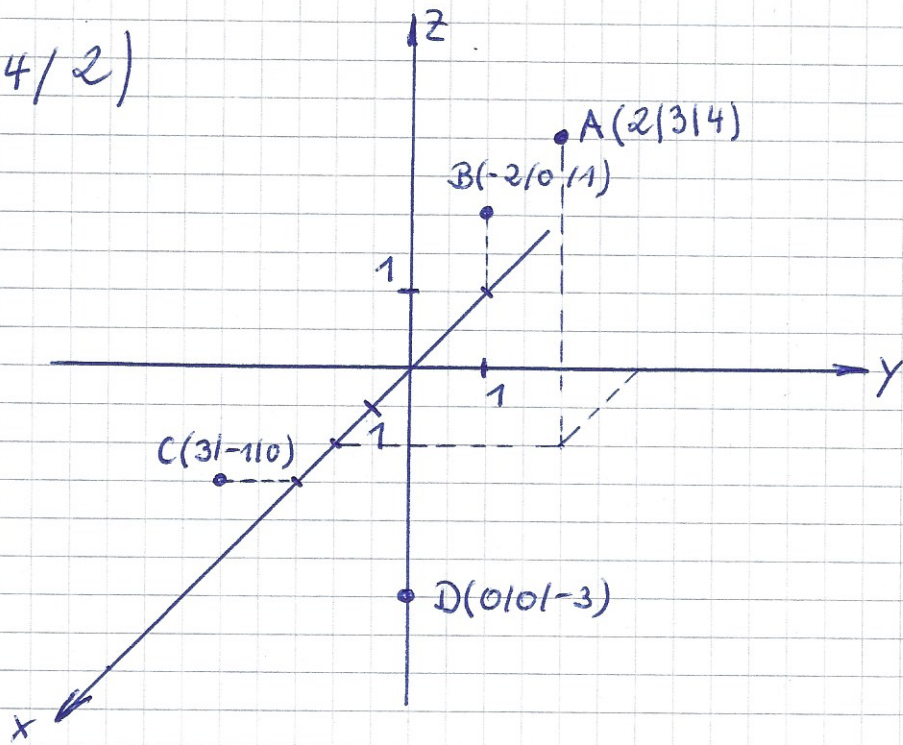
$$\vec{AB} = (2-2)\vec{i} + (4-0)\vec{j} + (-1+1)\vec{k} = \begin{pmatrix} 0 \\ 4 \\ 0 \end{pmatrix}$$

$$\vec{BC} = -2\vec{i} = \begin{pmatrix} -2 \\ 0 \\ 0 \end{pmatrix}; \quad \vec{DC} = -2\vec{i} - \vec{k} = \begin{pmatrix} -2 \\ 0 \\ -1 \end{pmatrix}$$

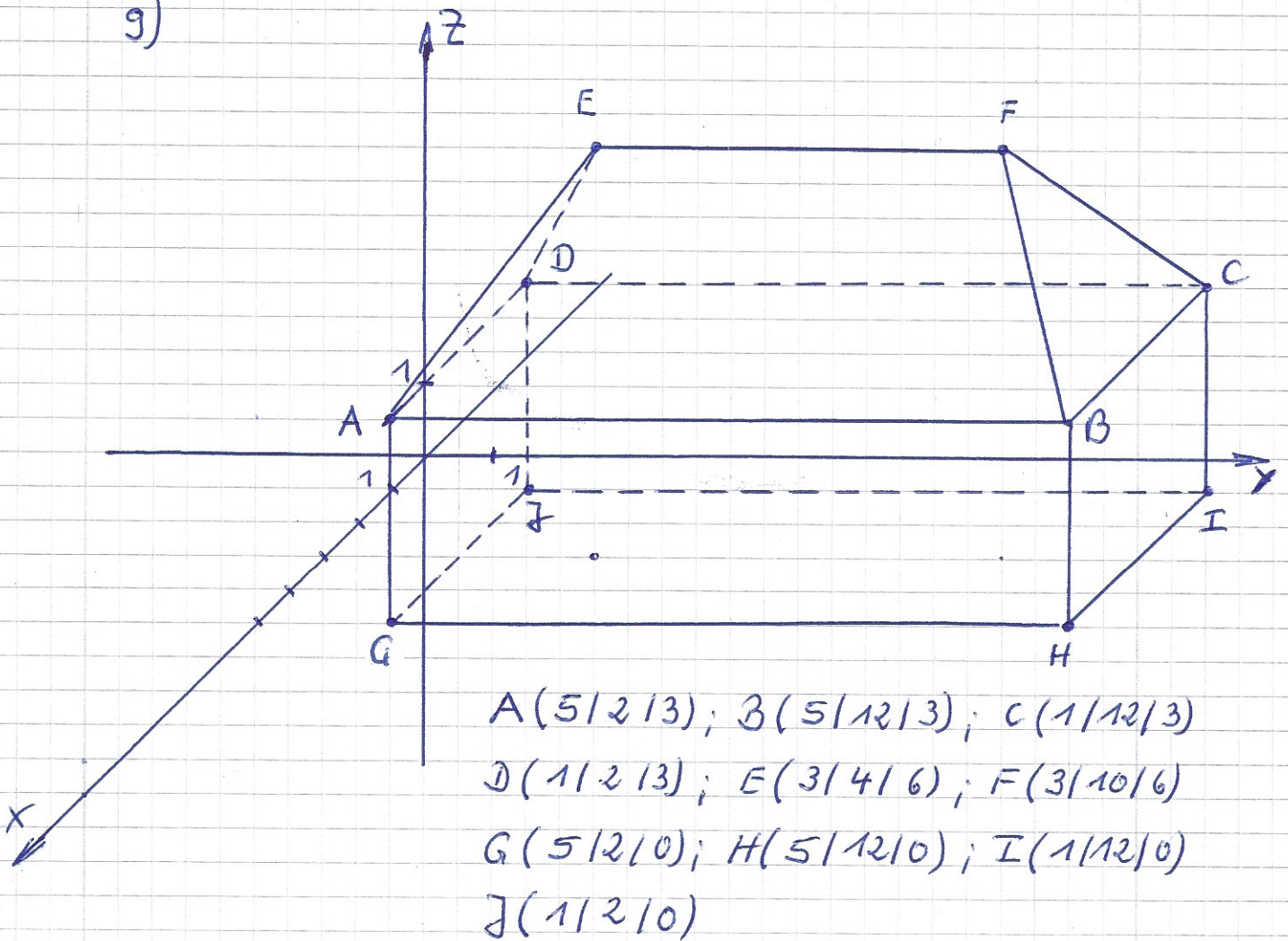
$$\vec{AP}_3 = -2\vec{i} = \begin{pmatrix} -2 \\ 0 \\ 0 \end{pmatrix}; \quad \vec{CB} = 2\vec{i} = \begin{pmatrix} 2 \\ 0 \\ 0 \end{pmatrix}$$

$$\vec{DB} = -\vec{k} = \begin{pmatrix} 0 \\ 0 \\ -1 \end{pmatrix}$$

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- 10) $A(2|0|3) \sim D(2|0|8)$
 $B(6|2|3) \sim E(6|2|8)$
 $C(3|3|3) \sim F(3|3|8)$