

## Lösungen 1. Teil:

Liebe Schülerinnen und Schüler der 10. Klassen,

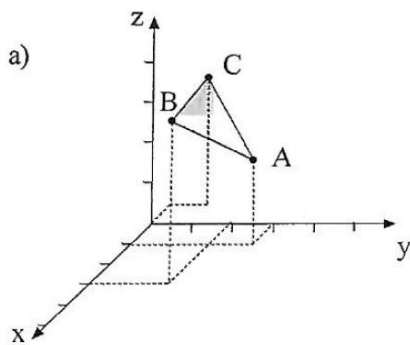
hier nun die ersten Lösungen. Solltet ihr Fragen oder Probleme haben, könnt ihr euch gern per Mail melden.

Bleibt gesund!

Freundliche Grüße,

M. Krause

- Lb. S. 124/1



b)

Dreieck ABC gleichschenkelig (zwei Seiten gleich lang):

$$d(A; B) = \sqrt{(b_1 - a_1)^2 + (b_2 - a_2)^2 + (b_3 - a_3)^2}$$

$$A = \begin{pmatrix} 1 \\ 3 \\ 2 \end{pmatrix} \rightarrow a_1 = 1, a_2 = 3, a_3 = 2$$

$$B = \begin{pmatrix} 3 \\ 2 \\ 4 \end{pmatrix} \rightarrow b_1 = 3, b_2 = 2, b_3 = 4$$

$$d(A; B) = \sqrt{(3 - 1)^2 + (2 - 3)^2 + (4 - 2)^2}$$

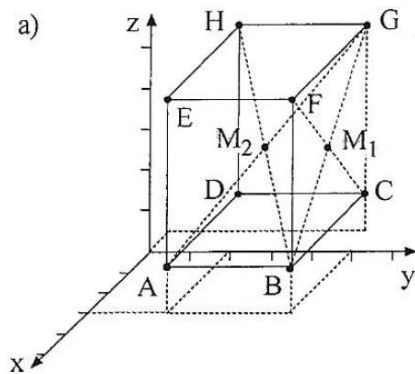
$$d(A; B) = \sqrt{9} = 3 \text{ LE}$$

$$d(B; C) = \sqrt{18} \text{ LE}$$

$$d(C; A) = \sqrt{9} = 3 \text{ LE}$$

$$\Rightarrow |\overline{AC}| = |\overline{AB}|$$

• Lb. S. 124/2



b)

$$C(-1|6|1), D(-1|2|1), E(3|2|5), F(3|6|5), H(-1|2|5)$$

c)

$$M(1|6|3)$$

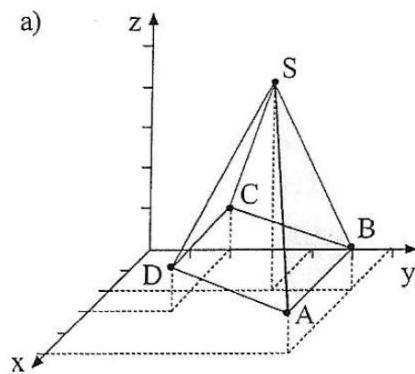
d)

Länge der Raumdiagonalen

$$d(A; G) = d(B; H)$$

$$d(A; G) = \sqrt{48} LE$$

• Lb. S. 124/3



b)

$$d(A; S) = \sqrt{29} LE$$

c)

Höhenfußpunkt

$$F(2|4|1)$$

Höhe der Pyramide

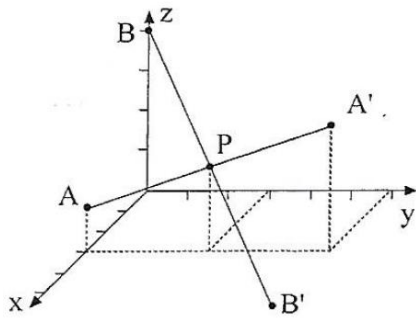
$$d(F; S) = 4 LE$$

• Lb. S. 124/4

$$d(A; G) = \sqrt{(13 - 5)^2 + (7 - 3)^2 + (x - 2)^2} = 12$$

$$x_1 = 10 \rightarrow G_1(10|7|13) \quad x_2 = -6 \rightarrow G_2(-6|7|13)$$

- Lb. S. 124/5



a)

$$P(3|3|2)$$

b)

$$B'(6|6|0)$$

- Lb. S. 126/Übung 1

a)  $\vec{a} = \overrightarrow{AB} = \overrightarrow{HG}$

b)  $\vec{a} = \overrightarrow{EH} = \overrightarrow{AD}$

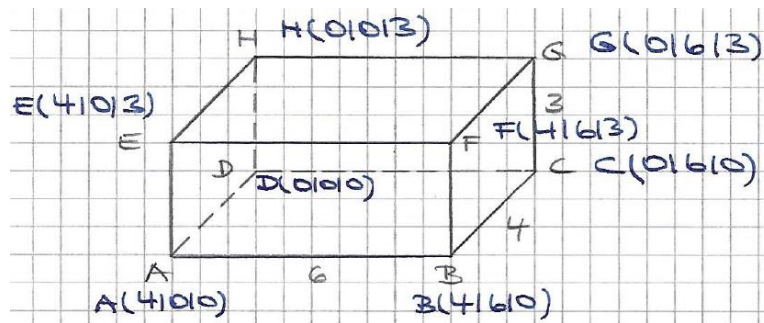
c)  $\vec{a} = \overrightarrow{DH} = \overrightarrow{AE} = \overrightarrow{BF} = \overrightarrow{CG}$

d)  $\vec{a} = \overrightarrow{CD} = \overrightarrow{FE}$

e)  $\vec{a} = \overrightarrow{HG} = \overrightarrow{AB}$

f)  $\vec{a} = \overrightarrow{AH} = \overrightarrow{BG}$

- Lb. S. 126/Übung 2

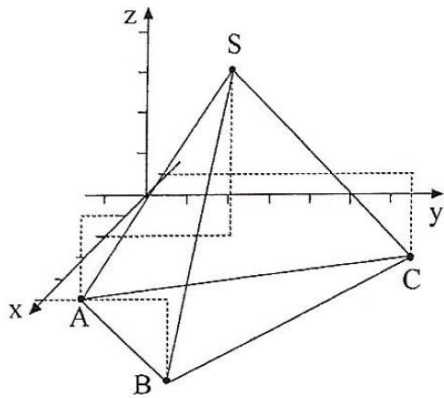


- a)  $\overrightarrow{CB} = \begin{pmatrix} 4 \\ 0 \\ 0 \end{pmatrix}$
- b)  $\overrightarrow{BC} = \begin{pmatrix} -4 \\ 0 \\ 0 \end{pmatrix}$
- c)  $\overrightarrow{AE} = \begin{pmatrix} 0 \\ 0 \\ 3 \end{pmatrix}$
- d)  $\overrightarrow{AH} = \begin{pmatrix} -4 \\ 0 \\ 3 \end{pmatrix}$
- e)  $\overrightarrow{BH} = \begin{pmatrix} -4 \\ -6 \\ 3 \end{pmatrix}$
- f)  $\overrightarrow{BG} = \begin{pmatrix} -4 \\ 0 \\ 3 \end{pmatrix}$
- g)  $\overrightarrow{DG} = \begin{pmatrix} 0 \\ 6 \\ 3 \end{pmatrix}$
- h)  $\overrightarrow{DC} = \begin{pmatrix} 0 \\ 6 \\ 0 \end{pmatrix}$
- i)  $\overrightarrow{AC} = \begin{pmatrix} -4 \\ 6 \\ 0 \end{pmatrix}$

- Lb. S. 127/ Übung 4

- c)  $\overrightarrow{PQ} = \begin{pmatrix} 4 \\ 4 \\ 4 \end{pmatrix}$
- d)  $\overrightarrow{PQ} = \begin{pmatrix} 6 \\ 6 \\ -6 \end{pmatrix}$
- e)  $\overrightarrow{PQ} = \begin{pmatrix} -1 \\ 2 \\ -5 \end{pmatrix}$
- f)  $\overrightarrow{PQ} = \begin{pmatrix} 1-a \\ 7 \\ -a+1 \end{pmatrix}$

- Lb. S. 127/Übung 5



b)

$$\overrightarrow{AB} = \begin{pmatrix} 4 \\ 4 \\ 0 \end{pmatrix}$$

$$\overrightarrow{AC} = \begin{pmatrix} -2 \\ 7 \\ 0 \end{pmatrix}$$

$$\overrightarrow{AS} = \begin{pmatrix} 1 \\ 4 \\ 6 \end{pmatrix}$$

c)

$$M(3|1|-2)$$

$$\overrightarrow{AM} = \begin{pmatrix} 2 \\ 2 \\ 0 \end{pmatrix}$$

- Lb. S. 128/Übung 6

d)  $|\vec{a}| = \sqrt{5^2 + (-2)^2 + 12^2} = \sqrt{173}$

e)  $|\vec{a}| = \sqrt{196} = 14$

f)  $|\vec{a}| = \sqrt{25a^2} = 5a$

- Lb. S. 128/Übung 7

b)  $|\vec{a}| = \sqrt{t^2 + (2t)^2} = \sqrt{5} \cdot t$

$$\sqrt{5} \cdot t = t + 1 \Rightarrow t = \frac{1}{\sqrt{5} - 1}$$

c)  $|\vec{a}| = \sqrt{(-2t)^2 + t^2 + (2t)^2} = 3t$

$$3t = 5 \Rightarrow t = \frac{5}{3}$$