

S.94/10a

$$\text{a) } \overrightarrow{AS} = \sigma \overrightarrow{SB} : \begin{pmatrix} 9 \\ -9 \\ 12 \end{pmatrix} = \sigma \begin{pmatrix} 12 \\ -8 \\ 16 \end{pmatrix} \quad \sigma = \frac{3}{4}$$

$\overrightarrow{AT} = \tau \overrightarrow{TB}$, wegen der harmonischen Teilung ist $\tau = -\sigma = -\frac{3}{4}$

$$\overrightarrow{AT} = -\frac{3}{4} \overrightarrow{TB} : \begin{pmatrix} t_1 - 2 \\ t_2 - 10 \\ t_3 - 5 \end{pmatrix} = -\frac{3}{4} \begin{pmatrix} 23 - t_1 \\ -4 - t_2 \\ 33 - t_3 \end{pmatrix}$$

$$4t_1 - 8 = -69 + 3t_1$$

$$t_1 = -69 + 8 = -61$$

$$4t_2 - 40 = 12 + 3t_2$$

$$t_2 = 12 + 40 = 52$$

$$4t_3 - 20 = -99 + 3t_3$$

$$t_3 = 20 - 99 = -61$$

T(-61 | 52 | -79)

S.94/12

$$\overrightarrow{AC} = \gamma \overrightarrow{CB} : \begin{pmatrix} 3 \\ 0 \\ -3 \end{pmatrix} = \gamma \begin{pmatrix} 2 \\ 0 \\ -2 \end{pmatrix}, \gamma = \frac{3}{2} \quad \overrightarrow{AD} = \delta \overrightarrow{DB} : \begin{pmatrix} 15 \\ 0 \\ -15 \end{pmatrix} = \delta \begin{pmatrix} -10 \\ 0 \\ 10 \end{pmatrix}$$

$\delta = -\frac{3}{2} = -\gamma$, also stimmt die Behauptung.