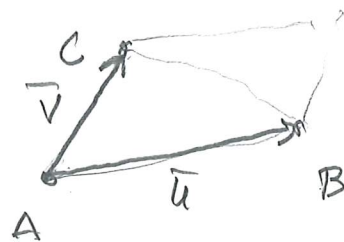


2.7.19

Beräkna arean av triangeln som har
hörn i $A: (-2, 4, 1)$, $B: (1, 3, 7)$ och $C: (2, -3, 0)$.

$$\begin{aligned}\vec{u} = \vec{AB} &= \vec{OB} - \vec{OA} = \underline{e} \begin{pmatrix} 3 \\ -1 \\ 6 \end{pmatrix} - \underline{e} \begin{pmatrix} -2 \\ 4 \\ 1 \end{pmatrix} \\ &= \underline{e} \begin{pmatrix} 3 \\ -1 \\ 6 \end{pmatrix}\end{aligned}$$



$$\begin{aligned}\vec{v} = \vec{AC} &= \vec{OC} - \vec{OA} = \underline{e} \begin{pmatrix} 2 \\ -3 \\ 0 \end{pmatrix} - \underline{e} \begin{pmatrix} -2 \\ 4 \\ 1 \end{pmatrix} \\ &= \underline{e} \begin{pmatrix} 4 \\ -7 \\ -1 \end{pmatrix}\end{aligned}$$

$$\text{Arean} = \frac{1}{2} |\vec{u} \times \vec{v}| = \frac{1}{2} \sqrt{43^2 + 27^2 + 17^2}$$

$$\vec{u} \times \vec{v} = \begin{pmatrix} 3 \\ -1 \\ 6 \end{pmatrix} \times \begin{pmatrix} 4 \\ -7 \\ -1 \end{pmatrix} = \underline{e} \begin{pmatrix} 1+42 \\ 24+3 \\ -21+4 \end{pmatrix} = \underline{e} \begin{pmatrix} 43 \\ 27 \\ -17 \end{pmatrix}$$