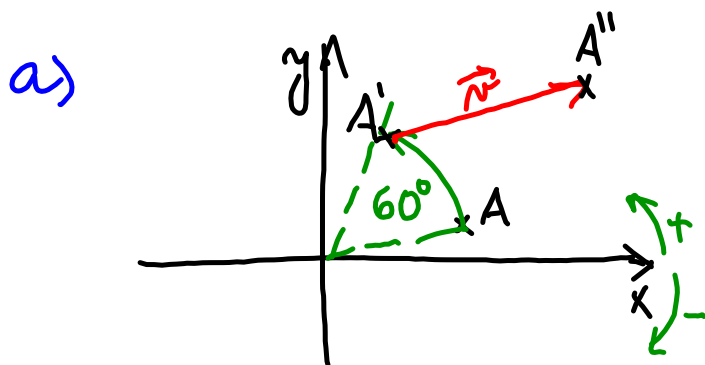


# MATICE TRANSFORMACE

PR: Úček matice složené transformace.

a) Otočení kolem počátku o úhel  $\alpha = 60^\circ$  je následováno posunem o vektor  $\vec{v} = (30, 20)$

b) Posunutí o  $\vec{v} = (30, 20)$  následováno otočením o  $\alpha = 60^\circ$ .



matice složene transformace

$$A' = R_\alpha \cdot A$$

$$A'' = T_{\vec{v}} \cdot A' = \underbrace{T_{\vec{v}} \cdot R_\alpha}_{\text{otoc + posun}} A$$

$IM$

Z TAHÁKU (viz 03\_projektivni\_prostor.pdf, str. 9)

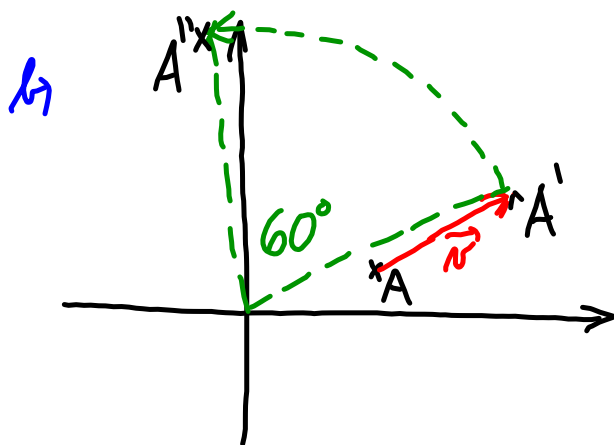
ROVINE:

$$T_{(30,20)} = \begin{pmatrix} 1 & 0 & 30 \\ 0 & 1 & 20 \\ 0 & 0 & 1 \end{pmatrix}$$

$$R_{60^\circ} = \begin{pmatrix} \cos 60^\circ & -\sin 60^\circ & 0 \\ \sin 60^\circ & \cos 60^\circ & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$$IM = T_{(30,20)} \cdot R_{60^\circ} = \begin{pmatrix} 1 \cdot \cos 60^\circ + 0 \cdot \sin 60^\circ + 30 \cdot 0 & 1 \cdot (-\sin 60^\circ) + 0 \cdot \cos 60^\circ + 30 \cdot 0 & 30 \\ \sin 60^\circ & \cos 60^\circ & 20 \\ 0 & 0 & 1 \end{pmatrix}$$

$$= \begin{pmatrix} \cos 60^\circ & -\sin 60^\circ & 30 \\ \sin 60^\circ & \cos 60^\circ & 20 \\ 0 & 0 & 1 \end{pmatrix}$$



$$\begin{aligned} A' &= T_{\vec{r}} \cdot A \\ A'' &= R_{\alpha} \cdot A' = R_{\alpha} \cdot T_{\vec{r}} \cdot A \end{aligned}$$

$\underbrace{\hspace{1.5cm}}_{M}$

$$\begin{aligned} M &= R_{60^\circ} \cdot T_{(30,20)} = \begin{pmatrix} \cos 60^\circ & -\sin 60^\circ & 0 \\ \sin 60^\circ & \cos 60^\circ & 0 \\ 0 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 1 & 0 & 30 \\ 0 & 1 & 20 \\ 0 & 0 & 1 \end{pmatrix} = \\ &= \begin{pmatrix} \cos 60^\circ & -\sin 60^\circ & \cos 60^\circ \cdot 30 + (-\sin 60^\circ \cdot 20) + 0 \cdot 1 \\ \sin 60^\circ & \cos 60^\circ & \sin 60^\circ \cdot 30 + \cos 60^\circ \cdot 20 + 0 \cdot 1 \\ 0 & 0 & 1 \end{pmatrix} \end{aligned}$$