from trigonometry import sin, cos

$$M = \begin{bmatrix} S\_v_1 & S\_v_2 \\ S\_v_2 & S\_v_3 \end{bmatrix} \begin{bmatrix} cos\left(theta\right) & -sin\left(theta\right) \\ sin\left(theta\right) & cos\left(theta\right) \end{bmatrix}$$

$$v = \begin{bmatrix} \left(M_{1,1}, M_{2,1}\right)^T \; TP & \left(M_{1,2}, M_{2,2}\right)^T \; TP \end{bmatrix}$$

where

$$TP \in \mathbb{R}^{2 \times 3}$$

$$theta \in \mathbb{R}$$

$$S\_v \in \mathbb{R}^3$$