

$$8. \begin{bmatrix} \cos(\theta) & \sin(\theta) \\ -\sin(\theta) & \cos(\theta) \end{bmatrix} \begin{bmatrix} \alpha \\ \beta \end{bmatrix} = \begin{bmatrix} \sqrt{\alpha^2 + \beta^2} \\ 0 \end{bmatrix}$$

~~$$\begin{bmatrix} \cos(\theta) & \sin(\theta) \\ -\sin(\theta) & \cos(\theta) \end{bmatrix} \begin{bmatrix} \alpha \\ \beta \end{bmatrix} = \begin{bmatrix} \sqrt{\alpha^2 + \beta^2} \\ 0 \end{bmatrix}$$~~

$$\alpha \cos(\theta) + \beta \sin(\theta) = \sqrt{\alpha^2 + \beta^2}$$

$$-\alpha \sin(\theta) + \beta \cos(\theta) = 0$$

$$\beta \cos(\theta) = \alpha \sin(\theta)$$

$$\frac{\beta \cos(\theta)}{\alpha} = \frac{\sin(\theta)}{\cos(\theta)} = \tan(\theta)$$

~~$$\beta \cos(\theta)$$~~

$$\Rightarrow \tan^{-1}\left(\frac{\beta}{\alpha}\right) = \theta$$