$$\begin{bmatrix} p_{x} \cos \theta - p_{y} \sin \theta \\ p_{x} \sin \theta + p_{y} \cos \theta \end{bmatrix}$$

$$\begin{bmatrix} p_{x} \cos \theta \\ p_{x} \sin \theta \end{bmatrix}$$

$$\begin{bmatrix} -p_{y} \sin \theta \\ p_{y} \cos \theta \end{bmatrix}$$
(e)