$$X = \begin{bmatrix} \rho\cos(\phi) \\ \rho\sin(\phi) \end{bmatrix}$$

$$Y = \begin{bmatrix} \rho & \phi \end{bmatrix}$$

$$\frac{\partial X}{\partial Y} = \begin{bmatrix} \cos(\phi) & -\rho\sin(\phi) \\ \sin(\phi) & \rho\cos(\phi) \end{bmatrix}$$

$$\left|\frac{\partial X}{\partial Y}\right| = \rho$$

$$\left(\frac{\partial X}{\partial Y}\right)^{-1} = \begin{bmatrix} \cos(\phi) & \sin(\phi) \\ -\frac{\sin(\phi)}{\rho} & \frac{\cos(\phi)}{\rho} \end{bmatrix}$$