1 | **Jacobian Determinant for Polar**

We are to determine (pun not intended) the polar correction factor for a double integral, $dA = r\ dr\ d\theta$.
To do this, we will have to first figure the change of bases expressions such that we can take:

$$f(x, y) = g(r, \theta) \tag{1}$$

Fortunately, this is already derived to use from before.

$$\begin{cases} x = r\cos\theta \\ y = r\sin\theta \end{cases} \tag{2}$$

Therefore, we have that:

$$f(x, y) = f(r\cos\theta, r\sin\theta) \tag{3}$$