the answer may not be unique $(1, 0) \Rightarrow (1, 2\pi)$, etc.

the point $(1, 0)$ can be written as $(-1, \pi)$.

$r < 0$ is sometimes acceptable $(2, 45°) \Rightarrow (-2, 225°)$.

$r^2 = x^2 + y^2$

$r = \sqrt{x^2+y^2}$

$\tan\theta = \frac{y}{x}$

$\theta = \tan^{-1}\frac{y}{x}$

$x = r \cdot \sin\theta$

$= \sqrt{x^2+y^2} \cdot \sin\left(\tan^{-1}\frac{y}{x}\right)$

$y = \sqrt{x^2+y^2} \cdot \cos\left(\tan^{-1}\frac{y}{x}\right)$.

x - Symmetry $\Rightarrow$ $f(-\theta) = f(\theta)$.

y - $\Rightarrow$ $f(-\theta) = -f(\theta)$.