

1) Find the equation of the polar function $r = 2 \cos(\theta)$ in Cartesian coordinate system.
Hint: $x = r \cos(\theta)$, $y = r \sin(\theta)$ and $x^2 + y^2 = r^2$.

2) Suppose points $A = (2, -2)$ and $B = (2, \frac{7\pi}{4})$ are given in Cartesian and polar coordinate system, respectively. Find a representation of A in polar and B in Cartesian coordinate system.

3) Suppose, $r_1(\theta) = 1 + \sin(\theta)$ and $r_2(\theta) = 1 + \cos(\theta)$ are given. Find the area inscribed between r_2 and r_1 .

Hint: First, find points at which $r_2 = r_1$ in the interval $[0, 2\pi]$. These obtained points are the boundaries of the integral $\frac{1}{2} \int (r_1(\theta)^2 - r_2(\theta)^2) d\theta$ that gives you the area inscribed between these two functions.