

1. Convert each point from rectangular coordinates to polar coordinates

(a)  $(2, 2)$       (b)  $(-3, 6)$       (c)  $(-5, 0)$

2. Convert each point from polar coordinates to rectangular coordinates

(a)  $\left(2, \frac{\pi}{3}\right)$       (b)  $(-2, \pi)$       (c)  $\left(-2, \frac{\pi}{2}\right)$

3. Convert each equation from rectangular coordinates to polar coordinates

(a)  $y = x$       (b)  $(x + 3)^2 + y^2 = 9$       (c)  $y = 7$

4. Convert each equation from polar coordinates to rectangular coordinates

(a)  $\theta = \frac{2\pi}{3}$       (b)  $r = 4 \sec(\theta)$       (c)  $r = 4 \sin(\theta)$

5. Sketch the region  $1 \leq r \leq 3, 0 \leq \theta \leq \pi$

6. Sketch the region  $2 \leq r \leq 4 \sin(\theta)$