

$$x = r \cos \theta$$

$$y = r \sin \theta$$

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

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

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

8.  $(7, \frac{\pi}{2})$   
r     $\theta$

$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$x = 7 \cos \frac{\pi}{2}$$

$$y = 7 \sin \frac{\pi}{2}$$

$$x = 7(0)$$

$$y = 7(1)$$

$$x = 0$$

$$y = 7$$

$$(0, 7)$$

9.  $(-3, \frac{5\pi}{6})$   
r     $\theta$

$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$x = -3 \cos \frac{5\pi}{6}$$

$$y = -3 \sin \frac{5\pi}{6}$$

$$x = -3(-\frac{\sqrt{3}}{2})$$

$$y = -3(\frac{1}{2})$$

$$x = \frac{3\sqrt{3}}{2}$$

$$y = -\frac{3}{2}$$

$$(\frac{3\sqrt{3}}{2}, -\frac{3}{2})$$

10.  $(-2.5, 133^\circ)$   
r     $\theta$

$$x = r \cos \theta \quad y = r \sin \theta$$

$$x = -2.5 \cos 133^\circ \quad y = -2.5 \sin 133^\circ$$

$$x = 1.70$$

$$y = -1.83$$

$$(1.7, -1.83)$$

11.  $(0, 5)$   
x    y

RECTANGULAR COORDINATES TO  
POLAR COORDINATES

① FIND r

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

$$r = \sqrt{0^2 + 5^2}$$

$$r = \sqrt{25}$$

$$r = 5$$

② CHECK IF ON UNIT CIRCLE

$$\cos \theta = \frac{x}{r} = \frac{0}{5} = 0$$

$$\sin \theta = \frac{y}{r} = \frac{5}{5} = 1$$

$$(0, 1)$$

$$\text{so } \theta = \frac{\pi}{2}$$

$$\text{ANS} = (5, \frac{\pi}{2})$$

③ IF NOT ON UNIT CIRCLE

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

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

$$\theta = \arctan(\frac{y}{x})$$