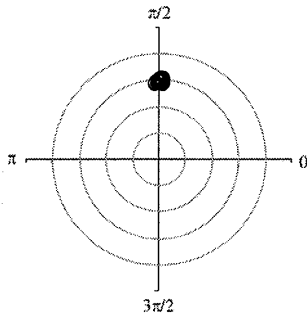


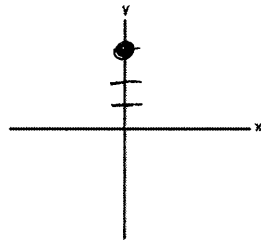
Key Polar \rightarrow Rectangular

Try to convert these polar points into rectangular without using the formulas:

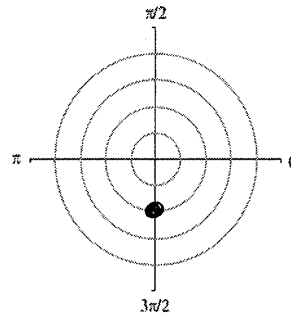
Convert $(3, \frac{\pi}{2})$ to rectangular



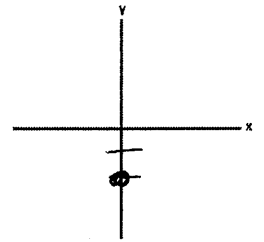
$(0, 3)$



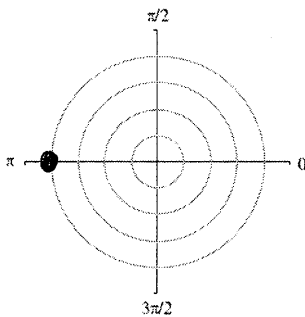
Convert $(-2, \frac{\pi}{2})$ to rectangular



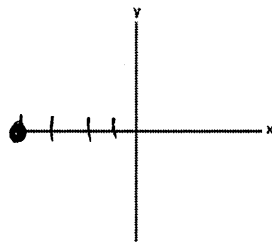
$(0, -2)$



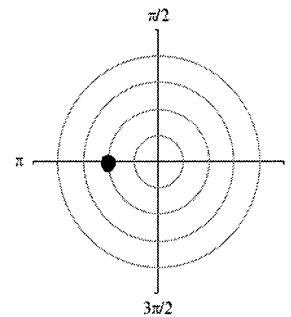
Convert $(-4, 2\pi)$ to rectangular



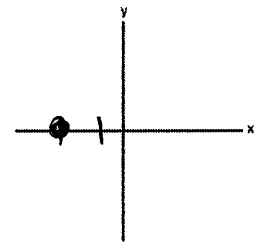
$(-4, 0)$



Convert $(2, \pi)$ to rectangular



$(-2, 0)$



Practice: Find the rectangular coordinates of each point with the given polar coordinates.

1. $(6, 120^\circ)$

$$x = 6 \cdot \cos(120) = 6(-\frac{1}{2})$$

$$y = 6 \cdot \sin(120) = 6(\frac{\sqrt{3}}{2})$$

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

2. $(-4, 45^\circ)$

$$x = -4 \cos 45 = -4(\frac{\sqrt{2}}{2})$$

$$y = -4 \sin 45 = -4(\frac{\sqrt{2}}{2})$$

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

3. $(3, \frac{7\pi}{6})$

$$x = 3 \cos(\frac{7\pi}{6}) = 3(-\frac{\sqrt{3}}{2})$$

$$y = 3 \sin(\frac{7\pi}{6}) = 3(-\frac{1}{2})$$

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

4. $(-2, \frac{5\pi}{6})$

$$x = -2 \cdot \cos \frac{5\pi}{6} = -2(-\frac{\sqrt{3}}{2})$$

$$y = -2 \sin \frac{5\pi}{6} = -2(\frac{1}{2})$$

$$(\sqrt{3}, -1)$$

5. $(-5, \frac{4\pi}{3})$

$$x = -5 \cos \frac{4\pi}{3} = -5(-\frac{1}{2})$$

$$y = -5 \sin \frac{4\pi}{3} = -5(-\frac{\sqrt{3}}{2})$$

$$(\frac{5}{2}, \frac{5\sqrt{3}}{2})$$

6. $(3, \frac{\pi}{2})$

$$x = 3 \cos \frac{\pi}{2} = 3 \cdot 0 = 0$$

$$y = 3 \sin \frac{\pi}{2} = 3 \cdot 1 = 3$$

$$(0, 3)$$