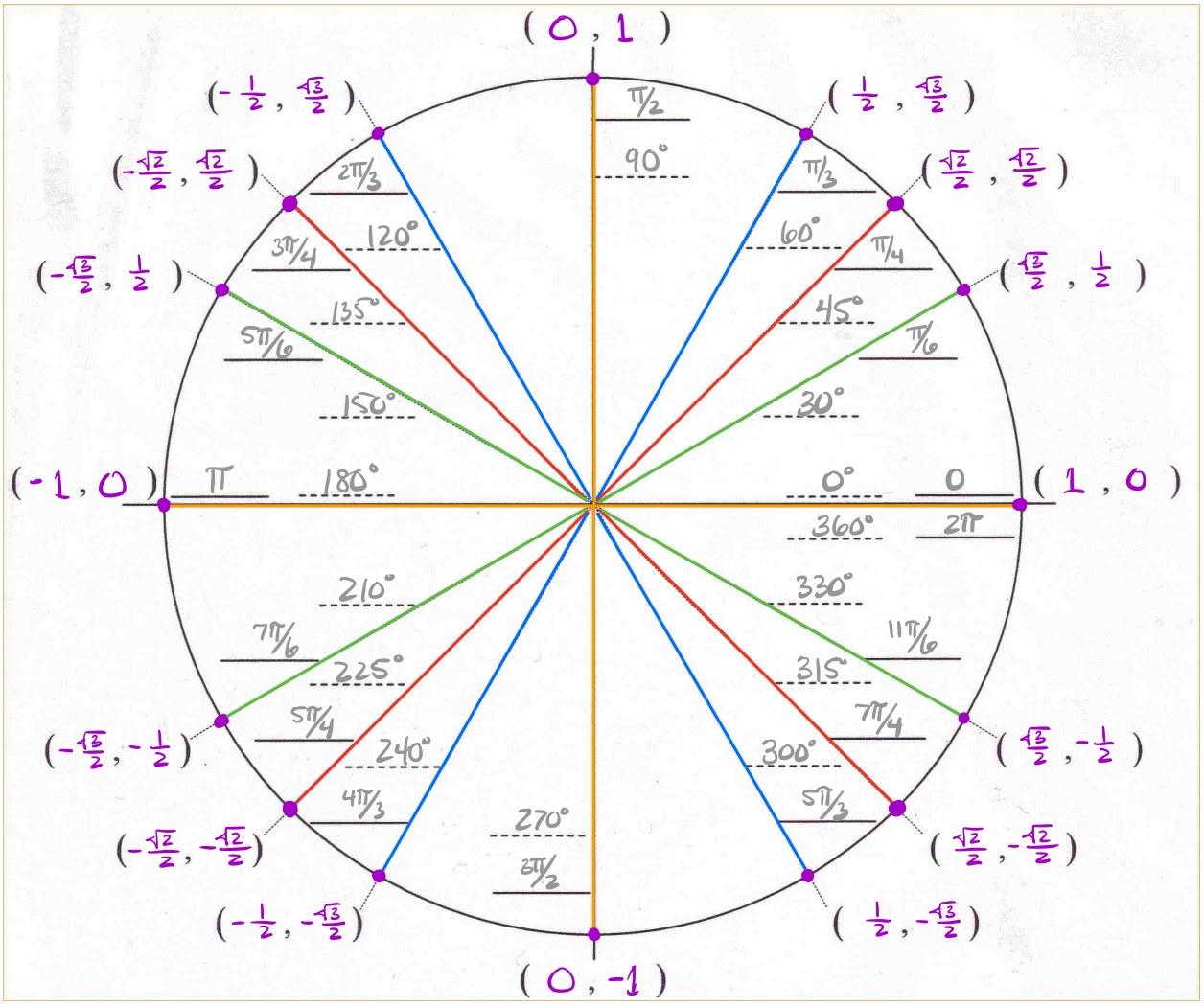
§1.2: The Unit Circle

1. Label the unit circle below by filling in the radian and degree measure, and the x and y coordinates of each point. Note, on the unit circle, the coordinate (x, y) corresponds to $(\cos\theta, \sin\theta)$, where θ is the positive angle corresponding to the point.



- $\cos(\theta)$ = "the x-coordinate of the point on the unit circle that corresponds to the angle θ"

"cosine of theta"

- $\sin(\theta)$ = "the y-coordinate of the point on the unit circle that corresponds to the angle θ"

"sine of theta"

2. Using the unit circle, determine the value of each expression below:

a.) $\cos\left(\frac{\pi}{2}\right) =$ 0 (the point corresponding to $\theta = \pi/2$ is $(0,1)$)

b.) $\sin\left(\frac{\pi}{3}\right) =$ $\frac{1}{2}$ (the point corresponding to $\theta = \pi/3$ is $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$)

c.) $\sin\left(\frac{7\pi}{4}\right) =$ $-\frac{\sqrt{2}}{2}$ (the point corresponding to $\theta = 7\pi/4$ is $\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$)

d.) $\cos\left(\frac{5\pi}{6}\right) =$ $-\frac{\sqrt{3}}{2}$ (the point corresponding to $\theta = 5\pi/6$ is $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$)

e.) $\sin\left(\frac{4\pi}{3}\right) =$ $-\frac{\sqrt{3}}{2}$ (the point corresponding to $\theta = 4\pi/3$ is $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$)

3. Using the unit circle, determine the angle(s) θ that makes each equation below true:

a.) $\sin(\theta) = \frac{1}{2}$ $\theta = \pi/6$ or $11\pi/6$

b.) $\cos(\theta) = -\frac{\sqrt{3}}{2}$ $\theta = 5\pi/6$ or $7\pi/6$

c.) $\sin(\theta) = -1$ $\theta = 3\pi/2$

d.) $\cos(\theta) = -\frac{\sqrt{2}}{2}$ $\theta = 3\pi/4$ or $5\pi/4$

e.) $\cos(\theta) = 0$ $\theta = \pi/2$ or $3\pi/2$