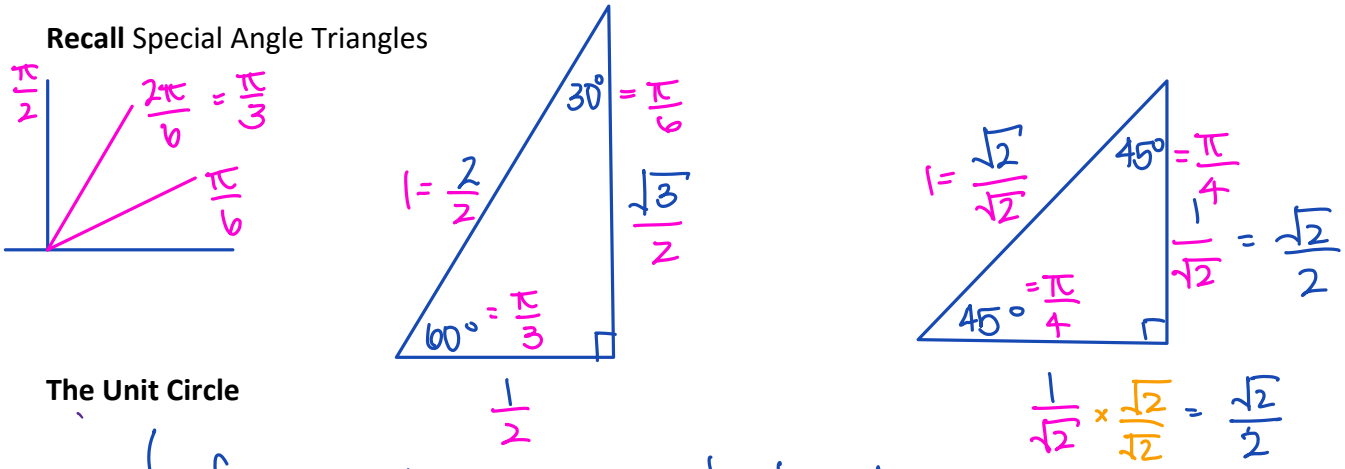
Name: _____ Date: _____

Learning Goal 4.1	Examining angles in standard position in both radians and degrees. Exploring the unit circle, reference and coterminal angles and special angles.

Recall Special Angle Triangles



The Unit Circle

↳ forcing the radius to be 1

(don't forget to rationalize)

$x^2+y^2=1$

Example Find the equation of a circle, centered at the origin, with a radius of 5.

$(x-x_1)^2+(y-y_1)^2=r^2$ centre: (x_1, y_1)

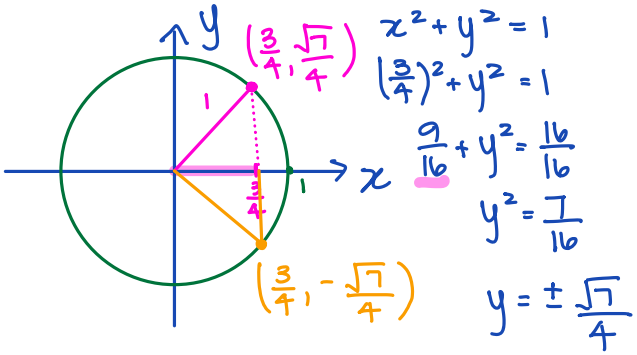
$x^2+y^2=25$

$y^2=25-x^2$

$y=\pm\sqrt{25-x^2}$

Example Find the co-ordinate(s) of all points on the unit circle that satisfy the conditions below. Include a diagram in your solution.

a. $x-$ coordinate of $3/4$.



$x^2+y^2=1$

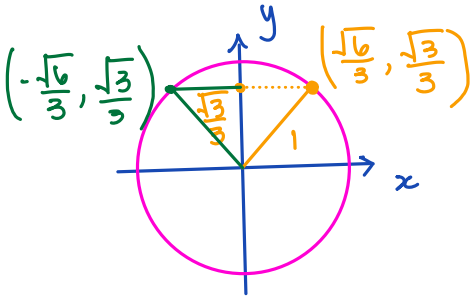
$(\frac{3}{4})^2+y^2=1$

$\frac{9}{16}+y^2=\frac{16}{16}$

$y^2=\frac{7}{16}$

$y=\pm\frac{\sqrt{7}}{4}$

b. $y-$ coordinate of $1/\sqrt{3}$. $\frac{1}{\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}}=\frac{\sqrt{3}}{3}$



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

$x^2+(\frac{\sqrt{3}}{3})^2=1$

$x^2+\frac{3}{9}=1$

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

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

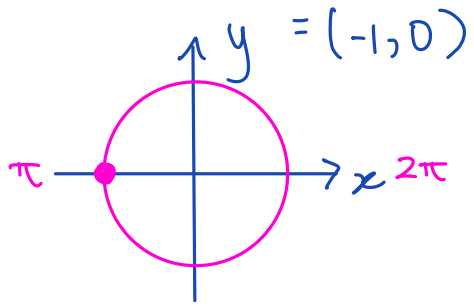
$=\pm\frac{\sqrt{6}}{3}$

Assignment p.186 # 1 – 13, 15, 16, 17, 20, C1, C4 Quiz Next Day!

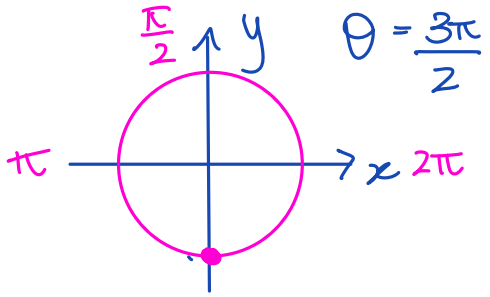
point ← defined by an angle.

Note $P(\theta) = (x, y)$ means we want the angle, θ, in standard position, that has the coordinates specified where the terminal arm of the angle intersects the unit circle.

Example Evaluate $P(\pi) = (x, y)$.

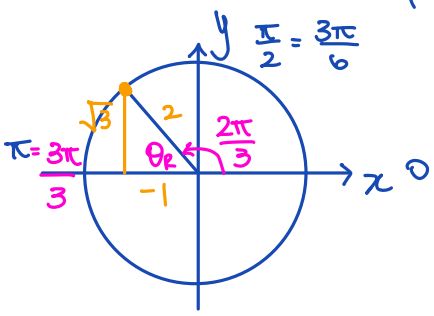


Example Given $P(\theta) = (0, -1)$, find θ in radians.



Example Evaluate.

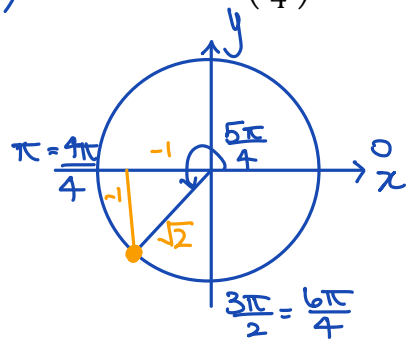
a. $P\left(\frac{2\pi}{3}\right) = P\left(\frac{4\pi}{6}\right)$



$\theta_R = \frac{3\pi}{3} - \frac{2\pi}{3} = \frac{\pi}{3}\ (60°)$

$P\left(\frac{2\pi}{3}\right) = (-1, \sqrt{3})$

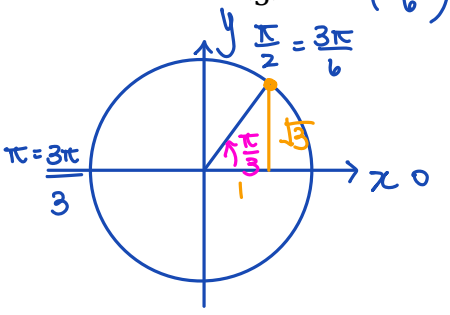
b. $P\left(\frac{5\pi}{4}\right)$



$\theta_R = \frac{5\pi}{4} - \frac{4\pi}{4} = \frac{\pi}{4}\ (45°)$

$P\left(\frac{5\pi}{4}\right) = (-1, -1)$

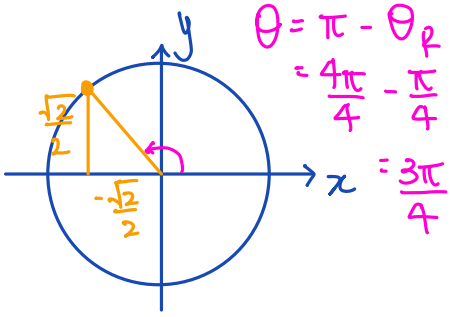
c. $P\left(\frac{\pi}{3}\right) = P\left(\frac{2\pi}{6}\right) = (1, \sqrt{3})$



$\theta_R = \frac{\pi}{3}\ (60°)$

Example Identify the measure for the central angle θ in the interval $0 \le \theta \le 2\pi$ such that $P(\theta)$ is the given point.

a. $\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$



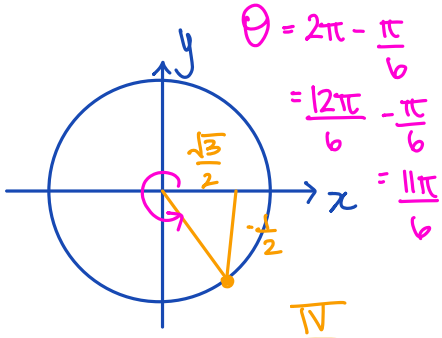
$\theta = \pi - \theta_R$

$= \frac{4\pi}{4} - \frac{\pi}{4}$

$= \frac{3\pi}{4}$

$\theta_R = 45° = \frac{\pi}{4}$

b. $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$



$\theta = 2\pi - \frac{\pi}{6}$

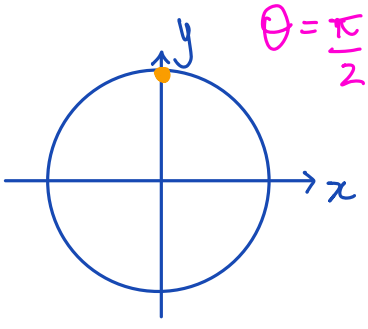
$= \frac{12\pi}{6} - \frac{\pi}{6}$

$= \frac{11\pi}{6}$

IV

$\theta_R = 30° = \frac{\pi}{6}$

c. $(0, 1)$



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