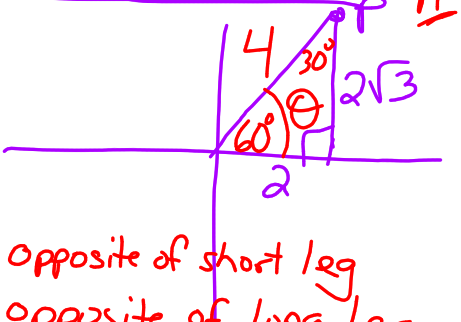
# Lesson for T-6

The terminal side of an angle $\theta$ in standard position passes through the given point. Sketch the angle and evaluate $\sin\theta$ and $\tan\theta$ Then find the value of $\theta$ between 0 and 360°.

simplify

1. $P(2, 2\sqrt{3})$



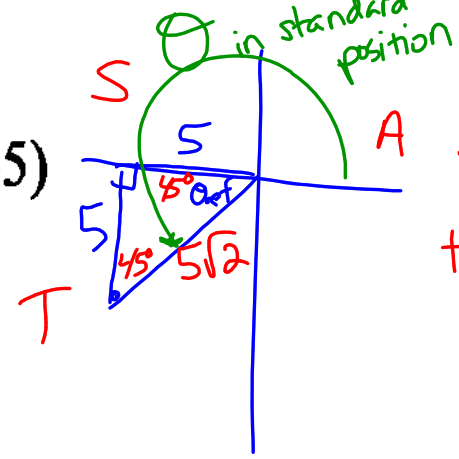

30° – opposite of short leg
60° – opposite of long leg

$\sin\theta = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$

$\tan\theta = \frac{2\sqrt{3}}{2} = \sqrt{3}$

$\theta = 60°$

2. $P(-5, -5)$

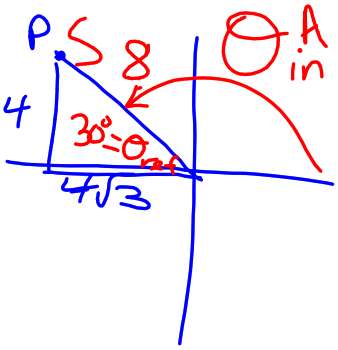



$\sin\theta = -\frac{5}{5\sqrt{2}} = -\frac{1}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \boxed{-\frac{\sqrt{2}}{2}}$

$\tan\theta = +\frac{5}{5} = \boxed{1}$

$\theta = 180° + 45 = \boxed{225°}$

3. $P(-4\sqrt{3}, 4)$

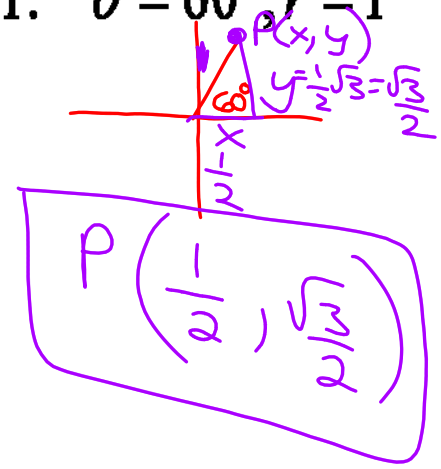



$\sin\theta = +\frac{4}{8} = \boxed{\frac{1}{2}}$

$\tan\theta = -\frac{4}{4\sqrt{3}} = -\frac{1}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}} = \boxed{-\frac{\sqrt{3}}{3}}$

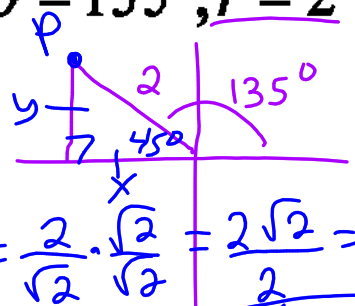
# Find x and y coordinates of P.

1. $\theta = 60°, r = 1$




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

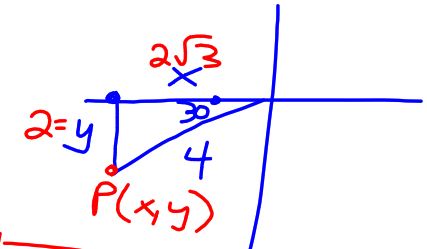
2. $\theta = 135°, r = 2$




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

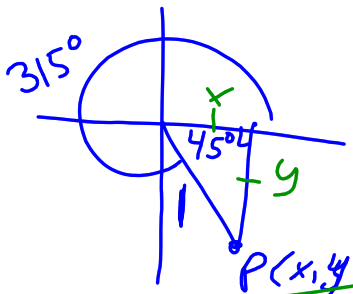
$P(-\sqrt{2}, \sqrt{2})$

3. $\theta = 210°, r = 4$




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

4. $\theta = 315°, r = 1$




$x = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

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