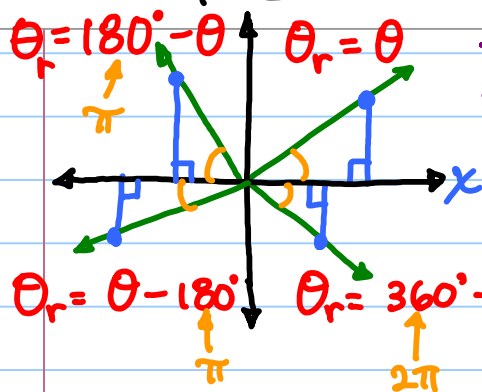


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WED

# 4.4 (part 2) | Reference Angles $\theta_r$



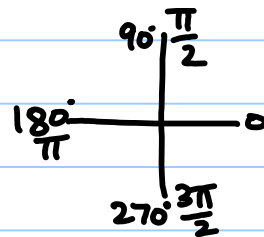
→ vertical to the x-axis  
→ acute angle ( $< 90^\circ, \frac{\pi}{2}$ )

S	A
T	C

ex 1) Find the reference  $\angle$

a)  $160^\circ$   $\theta_r = 180^\circ - 160^\circ = 20^\circ$

b)  $205^\circ$   $\theta_r = 205^\circ - 180^\circ = 25^\circ$



c)  $757^\circ$

d)  $-258^\circ + 360^\circ = 102^\circ$

e)  $\frac{2\pi}{3}$  ← QII

2 rotations  $\frac{-720}{360} = -2$   
 $37^\circ = \theta = \theta_r$

$102^\circ$  ← QII

$\theta_r = 180 - 102^\circ = 78^\circ$

$\theta_r = \pi - \frac{2\pi}{3} = \frac{\pi}{3}$

f)  $\frac{17}{6}\pi = \frac{5}{6}\pi$  QII

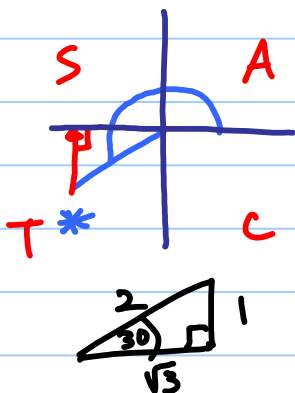
g)  $3.5$  rad QIII

$\theta_r = \pi - \frac{5}{6}\pi = \frac{\pi}{6}$

$3.14$  |  $\theta_r = 3.5 - 3.14 = 0.36$

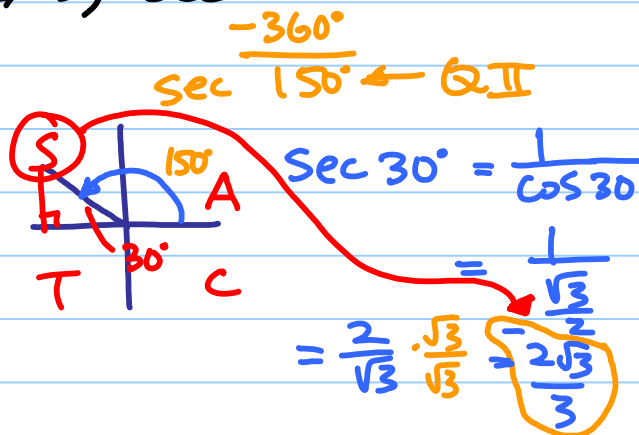
ex 2) Find  $\tan 210^\circ$

ex 3)  $\sec 510^\circ$



$\theta_r = \theta - 180^\circ = 210^\circ - 180^\circ = 30^\circ$

$\tan 30^\circ$ , QIII →  $\frac{\sqrt{3}}{3}$

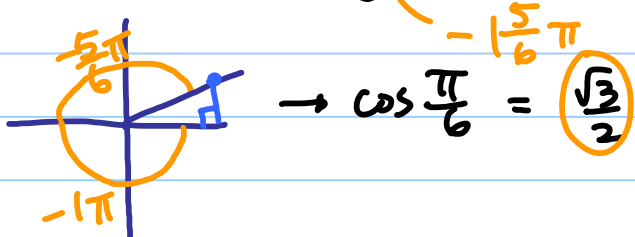


$\sec 150^\circ$  ← QII

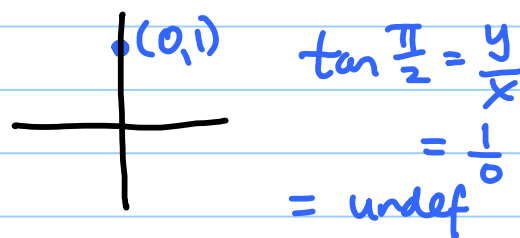
$\sec 30^\circ = \frac{1}{\cos 30^\circ} = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

ex 4)  $\cos -\frac{11}{6}\pi$

ex 5)  $\tan \frac{9\pi}{2}$



$\cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$



$\tan \frac{\pi}{2} = \frac{y}{x} = \frac{1}{0} = \text{undef}$

hw: p 513 #36-72 even