13.3. Advanced Algebra

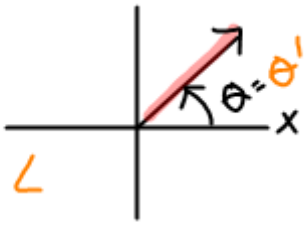
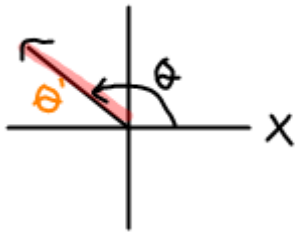
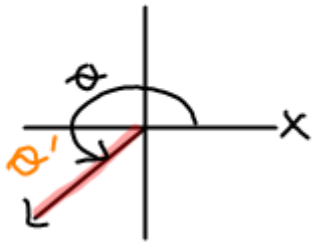
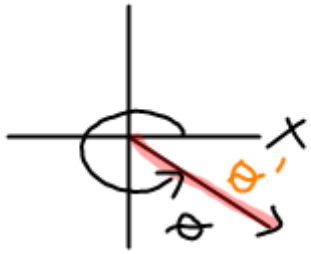
DATE: 5/6

Trig Functions of General Angles (Part 1)

Target 9.D. Determine the exact values of the six trigonometric functions given the terminal side of θ passing through a given point P(x,y) or using reference triangles.

Reference Angles: a reference angle is the acute angle formed by the terminal side of θ and the $x-axis$.

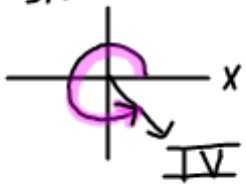
between 0° and 90°

Reference Angle Rule			
Quadrant I	Quadrant II	Quadrant III	Quadrant IV
			
Reference ∠ ↖ θ′ ↙ Theta prime θ′ = θ	θ′ = 180° − θ [θ′ = π − θ] Radian meas.	θ′ = θ − 180° [θ′ = θ − π] Rad. meas.	θ′ = 360° − θ [θ′ = 2π − θ] Rad. meas.

Sketch each angle, and then find its reference angle.

1. $300°$

SKETCH



$\theta' = 360 - 300$
$= 60°$ ✓

2. $-\frac{2\pi}{3} \cdot \frac{180}{\pi} = -120°$

1st find positive co-terminal ∠.

$-120° + 360° = 240°$

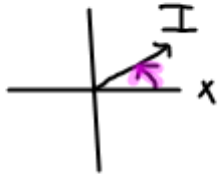
SKETCH

$\theta' = \theta - 180°$
$= 240 - 180$
$= 60° \cdot \frac{\pi}{180}$
$= \frac{\pi}{3}$ ✓

3. $37°$

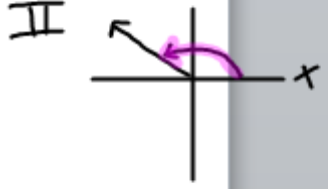
$\theta' = 37°$ ✓

SKETCH



4. $\frac{3\pi}{4} \cdot \frac{180}{\pi} = 135°$

SKETCH



$\theta' = 1\pi - \frac{3\pi}{4}$

$= \frac{\pi}{4}$ ✓