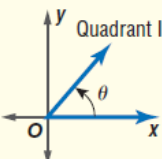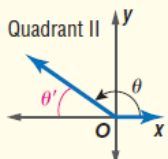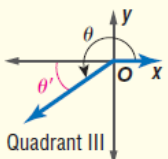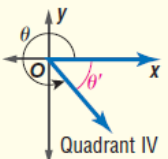# 12-3B Trigonometric Functions of General Angles
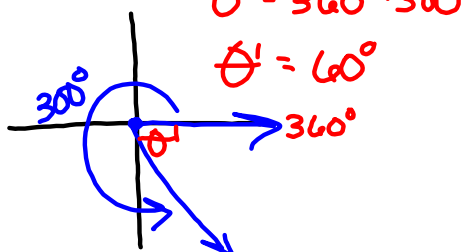## *reference triangles*

*reference angle:* If $\theta$ is a nonquadrantal angle in standard position, its reference angle, $\theta'$, is the acute angle formed by the **terminal side of $\theta$** and the **x-axis**.

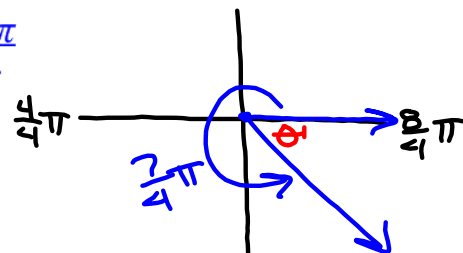- used to find trigonometric functions of angles greater than 90°

| Key Concept | Reference Angle Rule |
| --- | --- |

For any nonquadrantal angle $\theta$, $0° < \theta < 360°$ (or $0 < \theta < 2\pi$), its reference angle $\theta'$ is defined as follows.

| Quadrant I | Quadrant II | Quadrant III | Quadrant IV |
| --- | --- | --- | --- |
| $\theta' = \theta$ | $\theta' = 180° - \theta$ $(\theta' = \pi - \theta)$ | $\theta' = \theta - 180°$ $(\theta' = \theta - \pi)$ | $\theta' = 360° - \theta$ $(\theta' = 2\pi - \theta)$ |

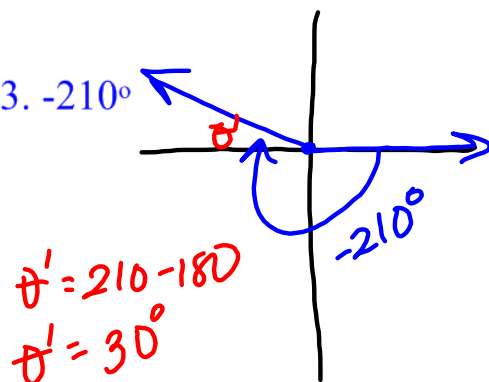**Examples:** *Find the reference angle for the given angles below.*

*1. 300°*

$\theta' = 360 - 300$
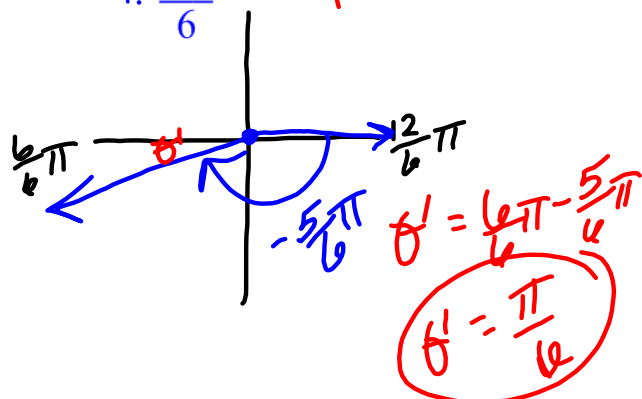
$\theta' = 60°$

$360°$

*2. $\frac{7\pi}{4}$*

$\theta' = \frac{8}{4}\pi - \frac{7}{4}\pi$

$\theta' = \frac{\pi}{4}$

*3. -210°*

$\theta' = 210 - 180$

$\theta' = 30°$

$-210°$

*4. $\frac{-5\pi}{6}$*

$\theta' = \frac{6}{6}\pi - \frac{5}{6}\pi$

$\theta' = \frac{\pi}{6}$

# 13-3b
# worksheet

P. 811,

4-6, 18-23

Attachments

13-3AB WS Key.notebook