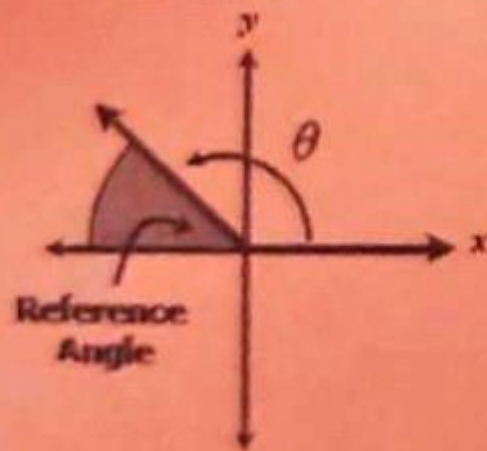| **Reference Angles**	For an angle θ in standard form, the <u>reference</u> angle is the positive acute angle form by the terminal side and the x-axis.

Reference Angle

For an angle θ in standard form, the <u>reference</u> angle is the positive acute angle form by the terminal side and the x-axis.

➤ All reference angles are positive, acute angles measuring between 0° and 90°.

➤ Finding Reference Angles for Angles greater than 360° or less than 360°

    1. Find a positive angle less than 360° or 2π that is conterminal with the given angle.

    2. Draw θ in standard position.

    3. Use the drawing to find the reference angle for the given angle

➤ When in radians, if the denominator is

    1. 3   the reference angle is <u>$\pi/3$</u>.

    2. 4   the reference angle is <u>$\pi/4$</u>.

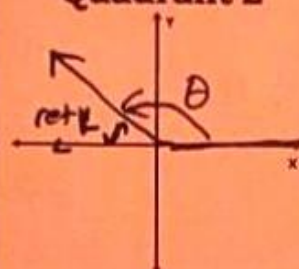   3. 6   the reference angle is <u>$\pi/6$</u>
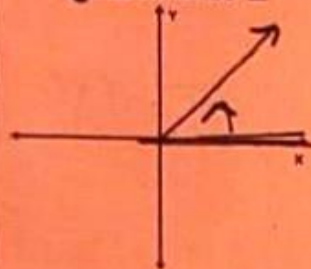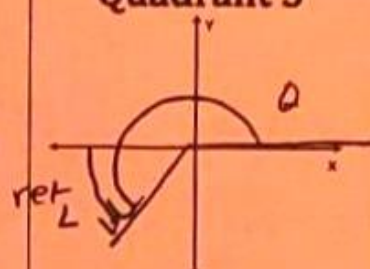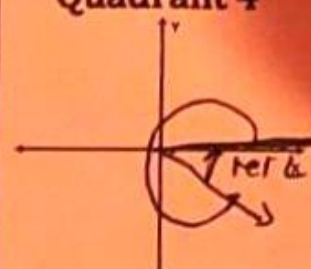
	Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4
	Degrees: $ref L = \theta$	Degrees: $ref L = 180 - \theta$	Degrees: $ref L = \theta - 180$	Degrees: $ref L = 360 - \theta$
	Radians: $ref L = \theta$	Radians: $ref L = \pi - \theta$	Radians: $ref L = \theta - \pi$	Radians: $ref L = 2\pi - \theta$

Directions: Find the reference angle for each angle.

1. $\theta = 57°$ Q1	2. $\theta = 145°$ Q2	3. $\theta = 210°$ Q3
$ref L = 57°$	$180 - 145 =$ $ref L = 35°$	$210 - 180 = 30°$ $ref L = 30°$
4. $\theta = 320°$ Q4 $360 - 320$ $ref L 40°$	5. $\theta = -240°$ Q2 $-240 + 360 = 120$ $ref L = 60°$	6. $\theta = 580°$ $580 - 360 = 220$ Q3 $220 - 180 = 40°$ $ref L = 40°$
7. $\theta = \frac{5\pi}{3}$ $= 300°$ Q4 $360 - 300 = 60°$ $ref L = \pi/3$	8. $\theta = \frac{7\pi}{4}$ $= 315°$ Q4 $360 - 315 = 45$ $ref L = \frac{\pi}{4}$	9. $\theta = -\frac{13\pi}{6}$ $= -390°$ $390 + 360 = -30 + 360$ $= 330$ Q3 $360 - 330 = 30$ $ref L = \pi/6$