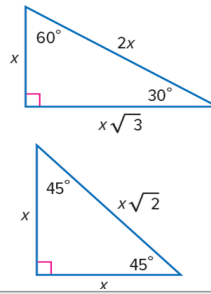


Key Concept Trigonometric Values for Special Angles

30°-60°-90°
 $\sin 30^\circ = \frac{1}{2}$ $\cos 30^\circ = \frac{\sqrt{3}}{2}$ $\tan 30^\circ = \frac{\sqrt{3}}{3}$
 $\sin 60^\circ = \frac{\sqrt{3}}{2}$ $\cos 60^\circ = \frac{1}{2}$ $\tan 60^\circ = \sqrt{3}$

45°-45°-90°
 $\sin 45^\circ = \frac{\sqrt{2}}{2}$ $\cos 45^\circ = \frac{\sqrt{2}}{2}$ $\tan 45^\circ = 1$

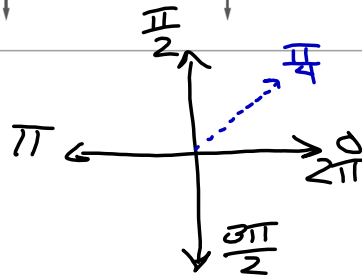
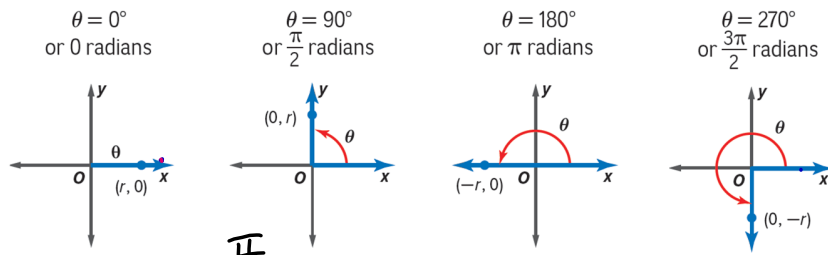


Helpful
Notes

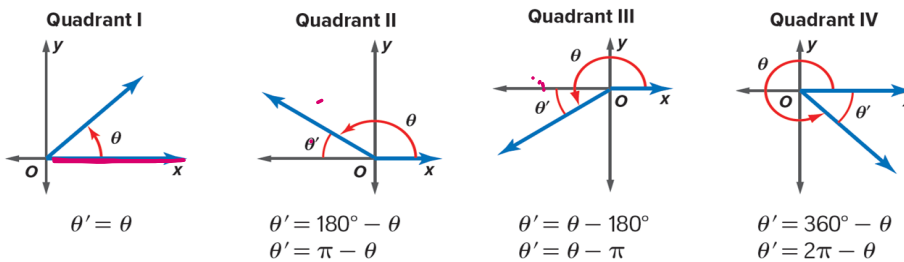
write
these
down

$\frac{\pi}{180^\circ}$

Key Concept Quadrantal Angles



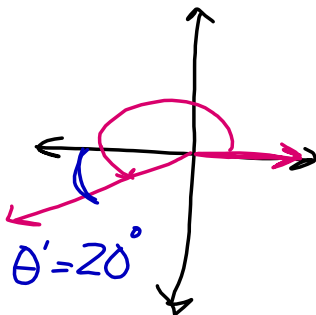
Key Concept Reference Angles



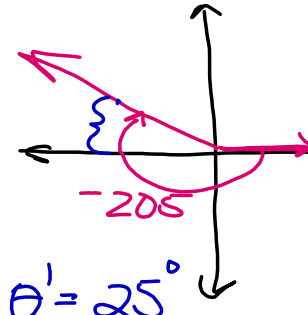
Reference Angle: Acute angle formed by the terminal side of θ and the x-axis.

Draw the angle and find the reference angle:

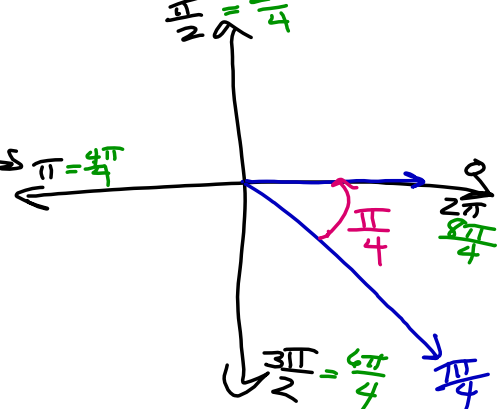
$\theta = 200^\circ$



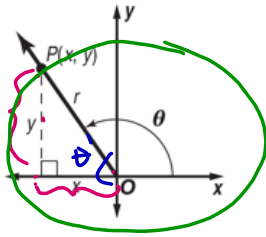
$\theta = -205^\circ$



$\theta = \frac{7\pi}{4}$



**Trigonometric Functions,
θ in Standard Position**



Let θ be an angle in standard position and let $P(x, y)$ be a point on the terminal side of θ . By the Pythagorean Theorem, the distance r from the origin is given by $r = \sqrt{x^2 + y^2}$. The trigonometric functions of an angle in standard position may be defined as follows.

$$\sin \theta = \frac{y}{r}$$

$$\cos \theta = \frac{x}{r}$$

$$\tan \theta = \frac{y}{x}, x \neq 0$$

$$\csc \theta = \frac{r}{y}, y \neq 0$$

$$\sec \theta = \frac{r}{x}, x \neq 0$$

$$\cot \theta = \frac{x}{y}, y \neq 0$$

← undefined

The point $(3, -4)$ is on the terminal side of θ in standard position. What are the 6 trig functions of θ ? (use the reference angle)

$$\sin \theta = -\frac{4}{5}$$

$$\csc \theta = \frac{5}{-4}$$

$$\cos \theta = \frac{3}{5}$$

$$\sec \theta = \frac{5}{3}$$

$$\tan \theta = -\frac{4}{3}$$

$$\cot \theta = \frac{3}{-4}$$

radius is positive →

$$r = \sqrt{(3)^2 + (-4)^2}$$

$$\sqrt{3^2 + 4^2}$$

$$r = \sqrt{9 + 16}$$

$$r = \sqrt{25}$$

$$r = 5$$

Practice:

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