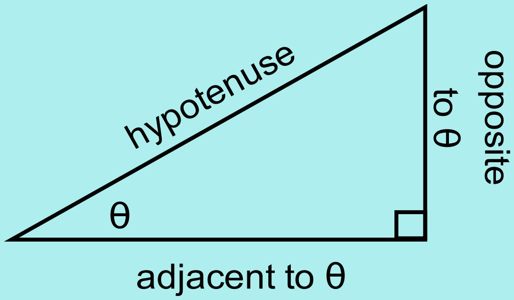
Recall:

For any angle of interest (θ), there are three (3) primary trigonometric ratios.

$$\text{sine of } \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\text{cosine of } \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\text{tangent of } \theta = \frac{\text{opposite}}{\text{adjacent}}$$

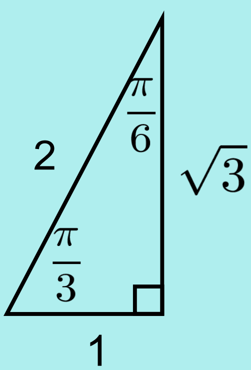


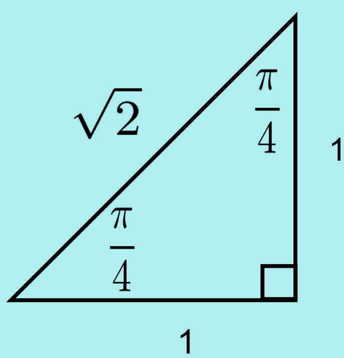
S o h C a h T o a

Apr 25-9:54 PM

Radian Angles on the Cartesian Plane

The Special Triangles can be used to identify exact values for trigonometric ratios of special angles.





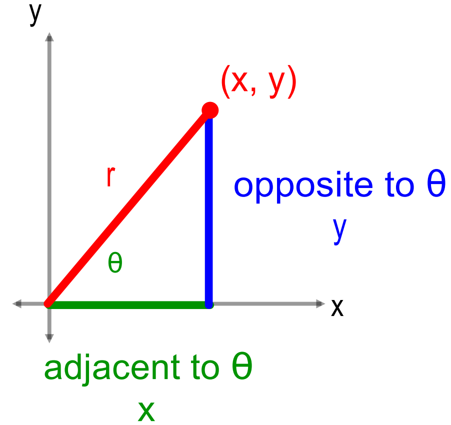
Oct 23-9:32 PM

Radian Angles on the Cartesian Plane

Oct 26/2016

An angle is in standard position if the vertex is at the origin and the initial arm is along the positive x-axis.

This angle can be described in terms of the point (x,y) at the end of the terminal arm,



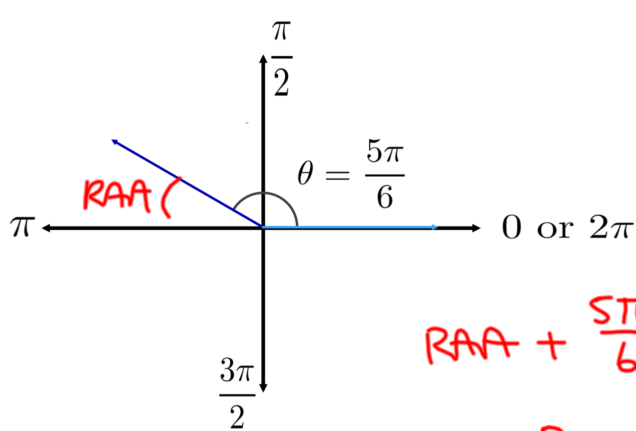
where: $r^2 = x^2 + y^2$

$$\sin\theta = \frac{y}{r} \qquad \cos\theta = \frac{x}{r} \qquad \tan\theta = \frac{y}{x}$$

$$\csc\ \theta = \frac{r}{y} \qquad \sec\ \theta = \frac{r}{x} \qquad \cot\ \theta = \frac{x}{y}$$

Apr 25-10:21 PM

The related acute angle (RAA) is the positive, acute angle between the nearest x-axis and the terminal arm.



$$RAA + \frac{5\pi}{6} = \pi$$

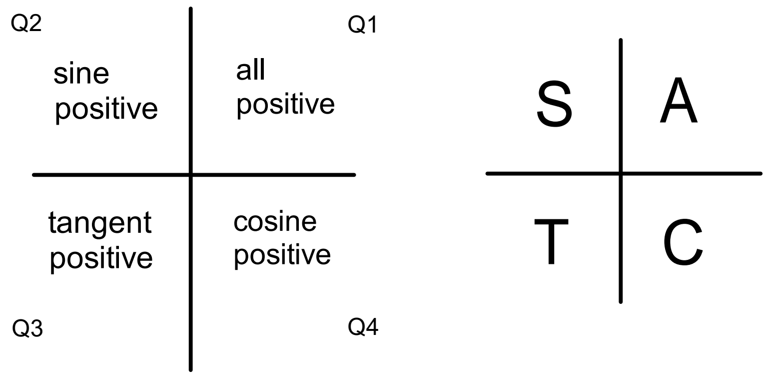
$$RAA = \pi - \frac{5\pi}{6}$$

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

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

Oct 23-8:49 AM

The CAST rule allows us to quickly determine the sign of each trig ratio for any quadrant.



Use the CAST rule, along with the Related Acute Angle (RAA) to solve for the angle.

May 3-9:19 AM

Ex.1 Evaluate using Cartesian definitions & special triangles.

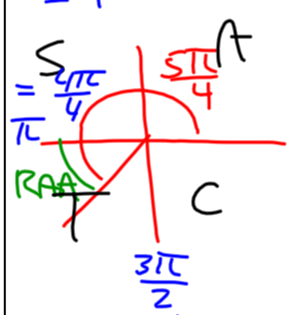
(a) $\sin\left(\frac{\pi}{2}\right)$ (b) $\cos\left(\frac{5\pi}{4}\right)$

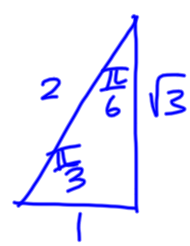
$= 1$

$= -\cos\left(\frac{\pi}{4}\right)$

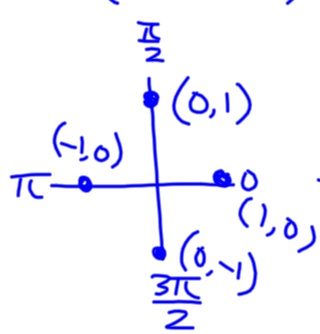
$= -\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{-\sqrt{2}}{2}$





P(cosθ, sinθ)



Oct 23-11:07 PM

Ex.2 Solve $\tan\theta = \frac{-7}{24}$ for $0 \le \theta < 2\pi$

① RAA?

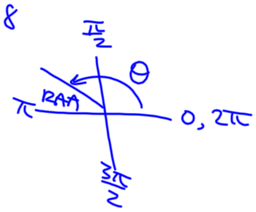
$\tan(RAA) = \frac{7}{24}$

$RAA = \tan^{-1}\left(\frac{7}{24}\right)$

$RAA \doteq 0.2838$

② S | A / T | C

Q2:

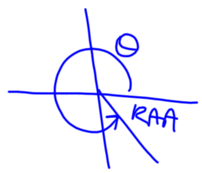


$\theta = \pi - RAA$

$\doteq \pi - 0.2838$

$\doteq 2.8578$

Q4:



$\theta = 2\pi - RAA$

$\doteq 5.9994$

Oct 23-11:11 PM

Assigned Work:

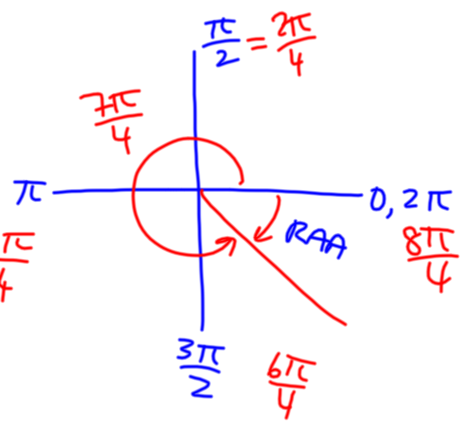
p.330 # 1-4, 5ace, 6ace, 7ace, 8ace, 9, 11, 13

1f

1(f) $\cot\left(\frac{7\pi}{4}\right)$

$= \frac{1}{\tan\left(\frac{7\pi}{4}\right)}$

$RAA = \frac{\pi}{4}$



S | A / T | C

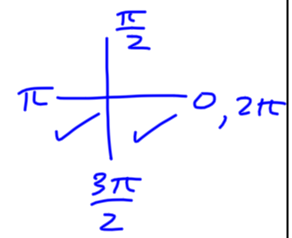
$\cot\left(\frac{7\pi}{4}\right) < 0$

OR

is negative

Oct 23-10:59 PM

6(a) $\pi \le \theta \le 2\pi$

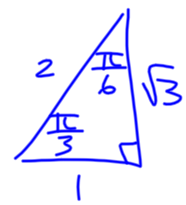


$\cos\theta = \frac{-1}{2}$

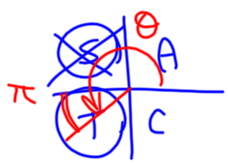
① RAA

$\cos RAA = \frac{1}{2}$

$RAA = \frac{\pi}{3}$



② CAST



Q3:

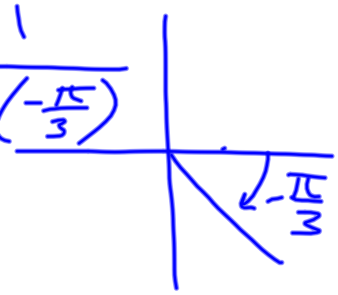
$\theta = \pi + \frac{\pi}{3}$

$\boxed{\theta = \frac{4\pi}{3}}$

Oct 27-12:42 PM

8(c) RAA $0 < RAA < \frac{\pi}{2}$

$\csc\left(\frac{-\pi}{3}\right) = \frac{1}{\sin\left(\frac{-\pi}{3}\right)}$



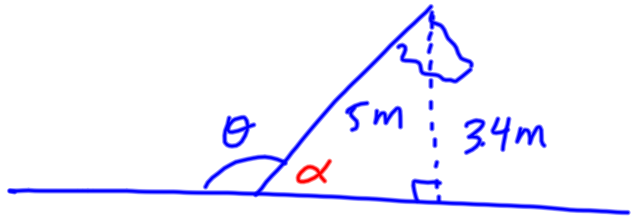
① $RAA = \frac{\pi}{3}$

②

$\csc\left(\frac{-\pi}{3}\right) = -\csc\left(\frac{\pi}{3}\right)$

Oct 27-12:45 PM

9.



$$\sin\alpha = \frac{3.4}{5}$$

$$\alpha = \sin^{-1}\left(\frac{3.4}{5}\right)$$

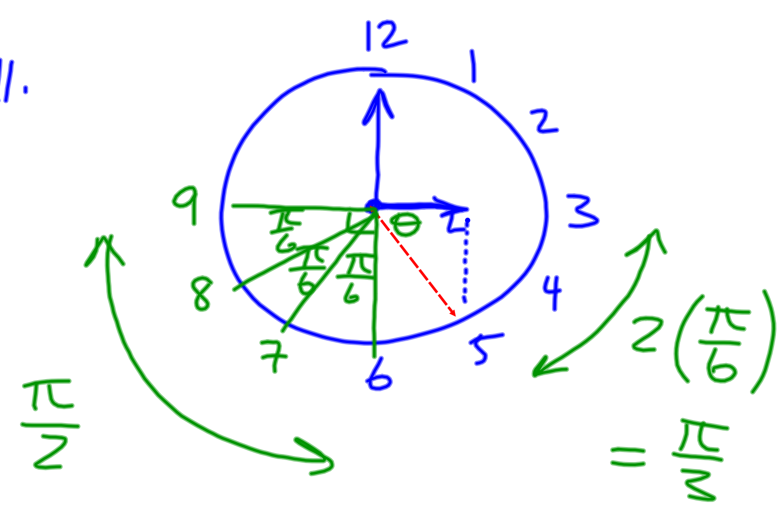
$$\alpha \doteq 0.7478$$

$$\theta = \pi - \alpha$$

$$\theta \doteq 2.3938$$

Oct 27-12:50 PM

11.



Oct 27-12:54 PM