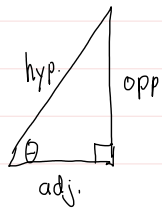


The Trigonometric Functions

Tuesday, February 17, 2015 3:11 PM



~~$$\begin{aligned} \sin \theta &= \frac{\text{opp}}{\text{hyp}} & \csc \theta &= \frac{\text{hyp}}{\text{opp}} \\ \cos \theta &= \frac{\text{adj}}{\text{hyp}} & \sec \theta &= \frac{\text{hyp}}{\text{adj}} \\ \tan \theta &= \frac{\text{opp}}{\text{adj}} & \cot \theta &= \frac{\text{adj}}{\text{opp}} \end{aligned}$$~~

θ acute

$$0 < \theta \leq \frac{\pi}{2}$$

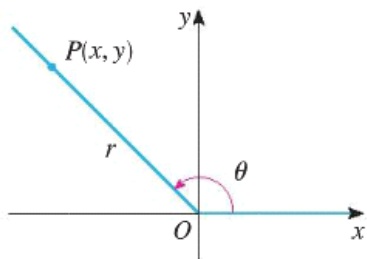


FIGURE 7

An angle in std. pos

$$\begin{aligned} \sin \theta &= \frac{y}{r} & \csc \theta &= \frac{r}{y} \\ \cos \theta &= \frac{x}{r} & \sec \theta &= \frac{r}{x} \\ \tan \theta &= \frac{y}{x} & \cot \theta &= \frac{x}{y} \end{aligned}$$

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

$$\frac{1}{\csc \theta} = \frac{1}{\left(\frac{r}{y}\right)} = 1 \cdot \left(\frac{y}{r}\right) = \sin \theta$$

coscant

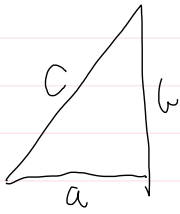
Sine

secant

cosine

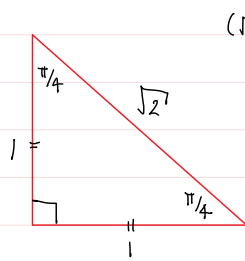
cotangent

tangent



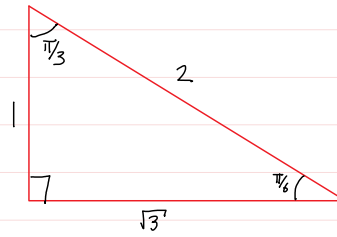
$$c^2 = a^2 + b^2$$

Two important Δ 's

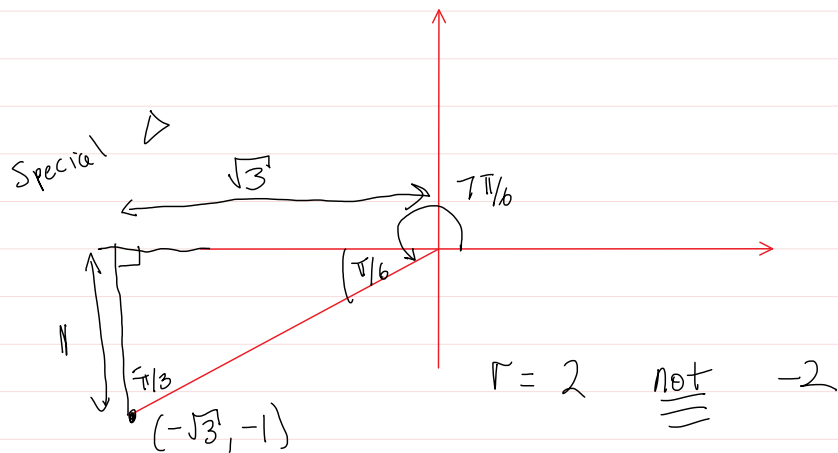


$$(\sqrt{2})^2 = 1^2 + 1^2$$

$$2^2 = (\sqrt{3})^2 + 1^2$$



Example compute the exact values of $\cot\left(\frac{7\pi}{6}\right)$ & $\cos\left(\frac{7\pi}{6}\right)$



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

$$\cot \theta = \frac{x}{y}$$

$$\theta = \frac{7\pi}{6}, \quad x = -\sqrt{3}, \quad y = -1, \quad r = 2$$

$$\cos \frac{7\pi}{6} = \frac{-\sqrt{3}}{2}$$

$$\cot \frac{7\pi}{6} = \frac{-\sqrt{3}}{-1} = \sqrt{3}$$