Section 13-8: The Reciprocal Trig Functions

Cotangent: $\cot\theta = \frac{1}{\tan\theta} = \frac{1}{\frac{y}{x}} = \frac{x}{y} = \frac{\cos\theta}{\sin\theta}$

Secant: $\sec\theta = \frac{1}{\cos\theta} = \frac{1}{x}$

Cosecant: $\csc\theta = \frac{1}{\sin\theta} = \frac{1}{y}$

Use your calculator to find the value of each to the nearest hundredth.

$\cos(131°) = -0.66$

$\tan\frac{8\pi}{27} = 1.34$

$\csc(-75°) = -1.04$

$= \frac{1}{\sin(-75°)}$

$\cot\frac{-4\pi}{13} = -0.69$

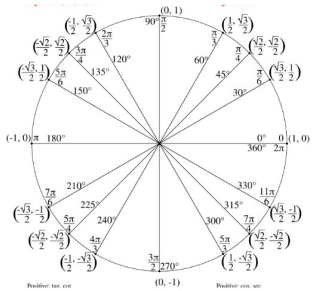
$= \frac{1}{\tan\frac{-4\pi}{13}}$

$\sec 14 = 7.31$

radians (no degree symbol)

$= \frac{1}{\cos 14}$

Use the Unit Circle to find the EXACT value of each.



1. $\sec 60° = \frac{1}{\cos 60} = \frac{1}{\frac{1}{2}} = 2$

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

$= \frac{1}{\sin\frac{7\pi}{4}} = \frac{1}{-\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

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

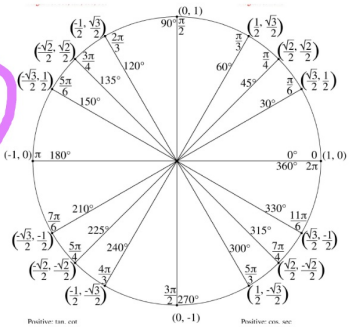
3. $\cot 16\pi$

$= \frac{1}{\tan 16\pi} = \frac{1}{\frac{0}{1}} = \frac{1}{0} =$ undefined

Use the Unit Circle to find the EXACT value of each.

4. $\sec\left(\frac{-17\pi}{6}\right)$

$= \frac{1}{\cos\frac{7\pi}{6}} = \frac{1}{-\frac{\sqrt{3}}{2}} = -\frac{2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$



5. $\csc 1620°$

$\frac{1}{\sin 180} = \frac{1}{0} =$ undefined

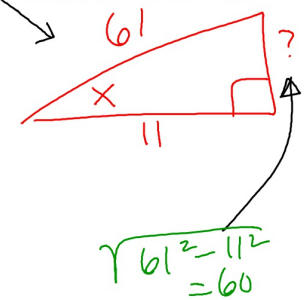
6. $\cot\frac{29\pi}{3}$

$\frac{1}{\tan\frac{5\pi}{3}} = \frac{1}{-\frac{\sqrt{3}}{2}} = \frac{1}{-\sqrt{3}/2}$

$= -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

Given that Cosx = $\frac{11}{61}$ $\frac{ADJ}{HYP}$

Evaluate the other five trig functions. Rationalize all denominators as needed and simplify fractions.



Sinx = $\frac{60}{61}$

Tanx = $\frac{60}{11}$

Cscx = $\frac{61}{60}$

Secx = $\frac{61}{11}$

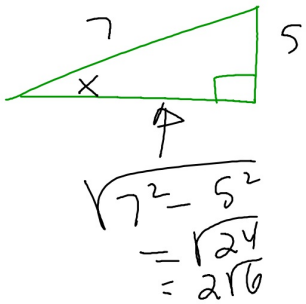
Cotx = $\frac{11}{60}$

Given that Cscx = $\frac{7}{5}$

Evaluate the other five trig functions. Rationalize all denominators as needed and simplify fractions.

Sinx = $\frac{5}{7}$

Cosx = $\frac{2\sqrt{6}}{7}$



Tanx = $\frac{5}{2\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}}$

$= \frac{5\sqrt{6}}{12}$

Secx = $\frac{7}{2\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}}$

$= \frac{7\sqrt{6}}{12}$

Cotx = $\frac{2\sqrt{6}}{5}$

You can now finish Hwk #22 Sec 13-8

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