Reciprocal Trigonometric Functions

The primary trigonometric functions are sinθ, cos θ and tan θ. There are also three reciprocal trigonometric functions

cosecant = csc $\csc\theta = \dfrac{1}{\sin\theta}$ cosecant

secant = sec $\sec\theta = \dfrac{1}{\cos\theta}$ Secant

cotangent = cot $\cot\theta = \dfrac{1}{\tan\theta}$ Cotangent

Determine the value of each of the following to 4 decimal places

a) $\csc 65^0 = \frac{1}{\sin 65^\circ} = 1.1034$

b) $\sec 4.38 = \frac{1}{\cos 4.38} = -3.0646$

c) $\cot 295^0 = \frac{1}{\tan 295^\circ} = -0.4663$

Solving for Exact Value

Use your unit circle to answer the following

$\cos 210^{o}$ $-\frac{\sqrt{3}}{2}$

$\csc 300^{o}$ → $\sin 300^{o}$ y $-\frac{\sqrt{3}}{2}$ flip our fraction $= \frac{-2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$ $\frac{-2\sqrt{3}}{3}$

$\sec \frac{4\pi}{3}$ $= -\frac{1}{2}$ $= \frac{-2}{1}$

Work on odd questions on handout

1. $\frac{2\sqrt{3}}{3}$

3. $-\sqrt{2}$

5. $-\sqrt{3}$

7. $-\sqrt{2}$

9. -2

11. $-\sqrt{3}$

13. $\frac{2\sqrt{3}}{3}$

15. $\frac{-2\sqrt{3}}{3}$

17. 2

Solving for ∅

$\sin \varnothing = 0.2345$

$\theta = \sin^{-1}(0.2345)$ 14°

$\cot \varnothing = 0.6874$

$\tan\theta = \frac{1}{0.6874}$ $\theta = \tan^{-1}\left(\frac{1}{0.6874}\right)$ 55°

$\cos\theta = \frac{-\sqrt{3}}{2}$

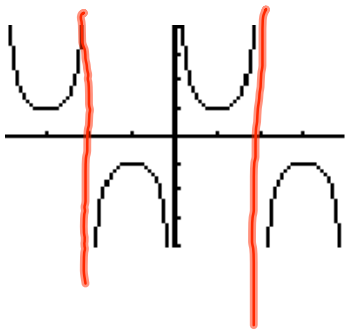
$\frac{5\pi}{6}$ 150°

$\frac{7\pi}{6}$ 210°

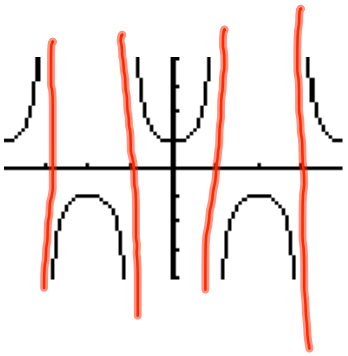
$0 \le \theta \le 2\pi$

Let's quickly look at the graphs of the reciprocal functions

$\csc\theta = \frac{1}{\sin\theta}$



$\sec\theta = \frac{1}{\cos\theta}$



$\cot\theta$