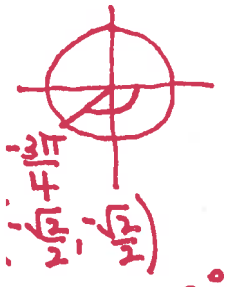
Math 125 Pre-Calculus
Fall 2017, 7.5 - 7.8

NAME: SOLUTIONS
CLASS TIME: 7 & 8 A.M.

Quiz # 8

Please show all of your work for maximum credit. Good luck!!!

1. **Find exact values without using your calculator. Show your work.**



(a) $\tan\frac{-3\pi}{4} = \frac{\sin\left(\frac{-3\pi}{4}\right)}{\cos\left(\frac{-3\pi}{4}\right)} = \frac{-\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} = \boxed{1}$

(b) $\sec 480^o = \frac{1}{\cos 480^o} = \frac{1}{\cos 120^o} = \frac{1}{-\cos 60^o} = \frac{1}{-\frac{1}{2}} = \boxed{-2}$

(c) $\csc\frac{-11\pi}{6} = \frac{1}{\sin\left(\frac{-11\pi}{6}\right)} = \frac{1}{\sin\frac{\pi}{6}} = \frac{1}{\frac{1}{2}} = \boxed{2}$

(d) $\cot 60^o = \frac{\cos 60^o}{\sin 60^o} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{2}\cdot\frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} = \boxed{\frac{\sqrt{3}}{3}}$

2. **(2 points) If $\cos\alpha = \frac{-\sqrt{3}}{5}$, *and α is in second quadrant*, find exact values for the other five trig functions.**

Sol. $\cos^2\alpha + \sin^2\alpha = 1$

$\left(\frac{-\sqrt{3}}{5}\right)^2 + \sin^2\alpha = 1$

$\frac{3}{25} + \sin^2\alpha = 1$

$\sin^2\alpha = 1 - \frac{3}{25}$

$\sin^2\alpha = \frac{22}{25}$

$\sin\alpha = \pm\sqrt{\frac{22}{25}} = \boxed{\frac{\sqrt{22}}{5}}$

$\cot\alpha = \boxed{\frac{-\sqrt{3}}{\sqrt{22}}}$ OR $\boxed{\frac{\sqrt{66}}{22}}$

$\tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{\sqrt{22}}{5}\cdot\frac{5}{-\sqrt{3}} = \boxed{\frac{-\sqrt{22}}{\sqrt{3}}}$ or $\boxed{\frac{-\sqrt{66}}{3}}$

$\sec\alpha = \boxed{\frac{-5}{\sqrt{3}}}$ or $\boxed{\frac{-5\sqrt{3}}{3}}$

$\csc\alpha = \boxed{\frac{5}{\sqrt{22}}}$ or $\boxed{\frac{5\sqrt{22}}{22}}$

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3. Without a calculator, evaluate the following exactly.

(a) $\cos^{-1}\left(\frac{-1}{2}\right)$ $\quad 0 < \cos^{-1} < \pi$

Sol: $\boxed{\frac{2\pi}{3}}$

(b) $\sin^{-1}\left(\frac{-\sqrt{2}}{2}\right)$ $\quad -\frac{\pi}{2} \le \sin^{-1} \le \frac{\pi}{2}$

Sol: $\boxed{-\frac{\pi}{4}}$

(c) $\cos\left(\cos^{-1}\left(\frac{1}{2}\right)\right)$ $\quad 0 < \cos^{-1} < \pi$

Sol: $\cos\left(\frac{\pi}{3}\right) = \boxed{\frac{1}{2}}$

(d) $\cos^{-1}\left(\cos\left(\frac{5\pi}{3}\right)\right)$ $\quad 0 < \cos^{-1} < \pi$

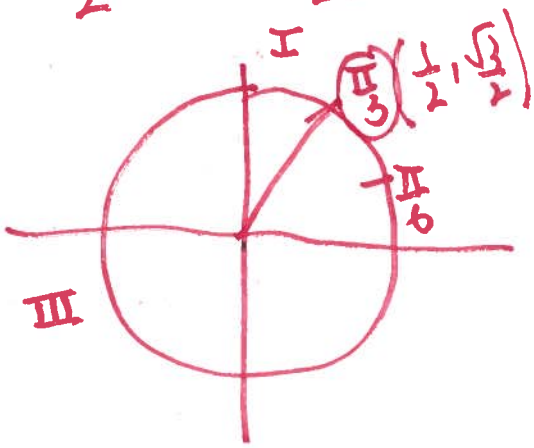
Sol: $\cos^{-1}\left(\frac{1}{2}\right) = \boxed{\frac{\pi}{3}}$

4. Solve the equation exactly for $0 \le t \le 2\pi$.

(a) $\tan t = \sqrt{3}$ $\quad -\frac{\pi}{2} < \tan^{-1} < \frac{\pi}{2}$

Sol: $t = \tan^{-1}(\sqrt{3})$

$\boxed{t = \frac{\pi}{3}, \frac{4\pi}{3}}$



$\pi + \frac{\pi}{3} = \frac{4\pi}{3}$