Math 116
Dusty Wilson
Review: Chapter 6

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1. Verify that $\dfrac{1+\csc\theta}{\cos\theta+\cot\theta}=\sec\theta$ is an identity.

$$\frac{1+\frac{1}{\sin\theta}}{\cos\theta+\frac{\cos\theta}{\sin\theta}} = \frac{\frac{\sin\theta+1}{\sin\theta}}{\frac{\cos\theta\sin\theta+\cos\theta}{\sin\theta}} = \frac{\sin\theta+1}{\cos\theta\sin\theta+\cos\theta}$$

$$= \frac{\sin\theta+1}{\cos\theta(\sin\theta+1)} = \frac{1}{\cos\theta} = \sec\theta$$

2. Convert $\sin(x-60^\circ)$ to a form involving $\sin x$, $\cos x$, and/or $\tan x$

$$\sin(x-60^\circ) = \sin x\cos 60^\circ - \cos x \sin 60^\circ$$
$$= \frac{1}{2}\sin x - \frac{\sqrt{3}}{2}\cos x$$

3. Evaluate $\cos\left[\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)-\cos^{-1}\left(\frac{1}{2}\right)\right]$ exactly, without a calculator.

$\frac{\pi}{3}$ $\quad$ $\frac{\pi}{3}$

$$\cos[0] = 1.$$