Math 11022 | Trigonometry | Spring 2015
Quiz 8 2.4 & 2.5 | Instructor: Matt Alexander
Name: Key | Quiz Score: ______ /10

1. Find the exact value of: $\cos\left(\frac{2\pi}{3} - \frac{\pi}{6}\right)$. (3pt)

$$\cos\left(\frac{2\pi}{3} - \frac{\pi}{6}\right) = \cos\left(\frac{2\pi}{3}\right)\cos\left(\frac{\pi}{6}\right) + \sin\left(\frac{2\pi}{3}\right)\sin\left(\frac{\pi}{6}\right) = -\frac{1}{2}\left(\frac{\sqrt{3}}{2}\right) + \frac{\sqrt{3}}{2}\left(\frac{1}{2}\right) = 0$$

OR $\cos\left(\frac{2\pi}{3} - \frac{\pi}{6}\right) = \cos\left(\frac{4\pi}{6} - \frac{\pi}{6}\right) = \cos\left(\frac{3\pi}{6}\right) = \cos\left(\frac{\pi}{2}\right) = 0$

2. Prove the identity $\sin\left(\frac{5\pi}{2} + x\right) = \cos(x)$ (3pt)

$$\sin\left(\frac{5\pi}{2} + x\right) = \sin\left(\frac{5\pi}{2}\right)\cos(x) + \cos\left(\frac{5\pi}{2}\right)\sin(x) = 1\cdot\cos(x) + 0\cdot\sin(x) = \cos(x)$$

3. Verify the identity using the sum of angle formula: (4pt)

$$\frac{1-\cos(2u)}{2} = \sin^2(u)$$

$$\frac{1-\cos(2u)}{2} = \frac{1-[1-2\sin^2(u)]}{2} = \frac{\cancel{1}-\cancel{1}+2\sin^2(u)}{2} = \frac{2\sin^2(u)}{2} = \sin^2(u)$$