

Math 26 Section 1

Quiz 7

1. (2 points) Prove the identity $\tan \theta \cot \theta = 1$

$$\tan \theta \cot \theta = \frac{\sin \theta}{\cos \theta} \frac{\cos \theta}{\sin \theta} = 1$$

2. (3 points) Prove the identity $(1 - \cos \theta)(1 + \cos \theta) = \sin^2 \theta$

$$(1 - \cos \theta)(1 + \cos \theta) = 1 - \cos^2 \theta = \sin^2 \theta$$

3. (3 points) Find the exact value of $\sin 75^\circ$

$$\begin{aligned}\sin 75^\circ &= \sin(30^\circ + 45^\circ) = \sin 30^\circ \cos 45^\circ + \cos 30^\circ \sin 45^\circ = \\ &= \frac{1}{2} \frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} \frac{\sqrt{2}}{2} = \frac{\sqrt{6} + \sqrt{2}}{4}\end{aligned}$$

4. (2 points) Use the identity for $\sin(A + B)$ to prove that

$$\sin(x + 2\pi) = \sin x$$

$$\sin(x + 2\pi) = \sin x \cos 2\pi + \cos x \sin 2\pi = \sin x$$