

MA 154 Lesson 4 Sec. 6.2
P. 372; 49, 51, 53, 54, 55
57, 58, 59, 61, 63

49. Verify The identity by transforming the left-hand side into The right-hand side.

$$\begin{aligned} 49. \quad \cos \theta \sec \theta &= 1 \\ \left(\frac{\cos \theta}{1} \right) \left(\frac{1}{\cos \theta} \right) &= \\ \frac{\cos \theta}{\cos \theta} &= \\ 1 &= 1 \end{aligned}$$

$$\begin{aligned} 51. \quad \sin \theta \sec \theta &= \tan \theta \\ \left(\frac{\sin \theta}{1} \right) \left(\frac{1}{\cos \theta} \right) &= \\ \frac{\sin \theta}{\cos \theta} &= \\ \tan \theta &= \tan \theta \end{aligned}$$

$$\begin{aligned} 53. \quad \frac{\csc \theta}{\sec \theta} &= \cot \theta \\ \frac{1}{\sin \theta} &= \\ \frac{1}{\cos \theta} &= \end{aligned}$$

$$\begin{aligned} \left(\frac{1}{\sin \theta} \right) \left(\frac{\cos \theta}{1} \right) &= \\ \frac{\cos \theta}{\sin \theta} &= \\ \cot \theta &= \cot \theta \end{aligned}$$

$$\begin{aligned} 54. \quad \cot \theta \sec \theta &= \csc \theta \\ \left(\frac{\cos \theta}{\sin \theta} \right) \left(\frac{1}{\cos \theta} \right) &= \\ \frac{1}{\sin \theta} &= \\ \csc \theta &= \csc \theta \end{aligned}$$

$$55. (1 + \cos 2\theta)(1 - \cos 2\theta) = \sin^2 2\theta$$

$$1 - \cos 2\theta + \cos 2\theta - \cos^2 2\theta =$$

$$1 - \cos^2 2\theta =$$

$$\sin^2 2\theta = \sin^2 2\theta$$

$$57. \cos^2 \theta (\sec^2 \theta - 1) = \sin^2 \theta$$

$$\cos^2 \theta \left(\frac{1}{\cos^2 \theta} - 1 \right) =$$

$$1 - \cos^2 \theta =$$

$$\sin^2 \theta = \sin^2 \theta$$

$$58. (\tan \theta + \cot \theta) \tan \theta = \sec^2 \theta$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$\sec^2 \theta = \sec^2 \theta$$

$$59. \frac{\sin(\theta/2)}{\csc(\theta/2)} + \frac{\cos(\theta/2)}{\sec(\theta/2)} = 1$$

$$\frac{\sin(\theta/2)}{1} + \frac{\cos(\theta/2)}{1} =$$

$$\left(\frac{\sin(\theta/2)}{1} \right) \left(\frac{\sin(\theta/2)}{1} \right) + \left(\frac{\cos(\theta/2)}{1} \right) \left(\frac{\cos(\theta/2)}{1} \right) =$$

$$\sin^2(\theta/2) + \cos^2(\theta/2) =$$

$$1 = 1$$

$$62. (1 + \sin \theta)(1 - \sin \theta) = \frac{1}{\sec^2 \theta}$$

$$1 - \sin \theta + \sin \theta - \sin^2 \theta =$$

$$1 - \sin^2 \theta =$$

$$\cos^2 \theta =$$

$$\frac{1}{\sec^2 \theta} = \frac{1}{\sec^2 \theta}$$

$$63. \sec \theta - \cos \theta = \tan \theta \sin \theta$$

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

$$\frac{1 - \cos^2 \theta}{\cos \theta} =$$

$$\frac{\sin^2 \theta}{\cos \theta} =$$

$$\left(\frac{\sin \theta}{\cos \theta} \right) \sin \theta =$$

$$\tan \theta \sin \theta = \tan \theta \sin \theta$$