

1. $\sin \theta \csc \theta = 1$

$$\sin \theta \left(\frac{1}{\sin \theta} \right) = 1$$

$$\boxed{1 = 1}$$

2. $\cot \theta \sin \theta = \cos \theta$

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

$$\boxed{\cos \theta = \cos \theta}$$

3. $\tan \theta \csc \theta = \sec \theta$

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

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

$$\boxed{\sec \theta = \sec \theta}$$

4. $\tan^2 \theta \cos^2 \theta = \sin^2 \theta$

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

$$\boxed{\sin^2 \theta = \sin^2 \theta}$$

5. $\cos \theta \csc \theta \tan \theta = 1$

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

$$\boxed{1 = 1}$$

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

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

$$\boxed{1 = 1}$$

7. $\sin \theta (\csc \theta - \sin \theta) = \cos^2 \theta$

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

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

$$\boxed{\cos^2 \theta = \cos^2 \theta}$$

8. $\frac{1 + \tan^2 \theta}{\tan^2 \theta} = \csc^2 \theta$

$$\frac{\sec^2 \theta}{\tan^2 \theta} = \csc^2 \theta$$

$$\frac{1}{\cos^2 \theta} \cdot \frac{\cos^2 \theta}{\sin^2 \theta} = \csc^2 \theta$$

$$\frac{1}{\sin^2 \theta} = \csc^2 \theta$$

$$\boxed{\csc^2 \theta = \csc^2 \theta}$$

9. $\frac{\csc \theta}{\sin \theta} - \frac{\cot \theta}{\tan \theta} = 1$

$$\frac{1}{\sin \theta} \cdot \frac{1}{\sin \theta} - \frac{\cos \theta}{\sin \theta} \cdot \frac{\cos \theta}{\sin \theta}$$

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

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

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

$$\boxed{1 = 1}$$

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

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

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

$$\frac{\cos \theta (1 - \cos \theta)}{1 - \cos \theta}$$

$$\frac{\cos \theta (1 - \cos \theta)}{1 - \cos \theta}$$

$$\boxed{\cos \theta = \cos \theta}$$

$$\frac{(1 + \cos \theta)(1 - \cos \theta)}{1 - \cos \theta}$$

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

$$\cos \theta = \cos \theta$$

11. $\frac{1 - \sin^2 \theta}{1 - \cos^2 \theta} = \cot^2 \theta$

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

$$\boxed{\cot^2 \theta = \cot^2 \theta}$$