

Activity 3.3: Verifying Trigonometric Identities

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Page 183 (Precalculus Book)

Fill in the blank to complete the fundamental trigonometric identity.

1. —
2. —
3. —

Verify the identity.

4. —

5. $\cos x + \sin x \tan x = \sec x$

$$\cos x + \sin x \frac{\sin x}{\cos x} = \sec x$$

$$\frac{\cos x}{1} + \frac{\sin^2 x}{\cos x} = \sec x$$

$$\frac{\cos^2 x}{\cos x} + \frac{\sin^2 x}{\cos x} = \sec x$$

$$\frac{\cos^2 x + \sin^2 x}{\cos x} = \sec x$$

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

$$\sec x = \sec x$$

6. —

7. $\sin^2 a - \sin^4 a = \cos^2 a - \cos^4 a$

$$\sin^2 a (1 - \sin^2 a) = \cos^2 a - \cos^4 a$$

$$\sin^2 a \cos^2 a = \cos^2 a - \cos^4 a$$

$$\cos^2 a (1 - \cos^2 a) = \cos^2 a - \cos^4 a$$

$$\cos^2 a - \cos^4 a = \cos^2 a - \cos^4 a$$

8. —

9. —

10. —

11. —

12. —

13. —

14. $\frac{\cos \theta \cot \theta}{1 - \sin \theta} - 1 = \csc \theta$

$$\frac{\cos \theta \cot \theta}{1 - \sin \theta} - \frac{1 - \sin \theta}{1 - \sin \theta} = \csc \theta$$

$$\frac{\cos \theta \cot \theta - (1 - \sin \theta)}{1 - \sin \theta} = \csc \theta$$

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

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

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

$$\frac{\frac{1}{\sin \theta} - \frac{\sin \theta}{\sin \theta}}{1 - \sin \theta} = \csc \theta$$

$$\frac{1 - \sin \theta}{\sin \theta} \times \frac{1}{1 - \sin \theta} = \csc \theta$$

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

$$\csc \theta = \csc \theta$$