A Review of Trigonometric Definitions, Facts, and Identities

Reciprocal Identities

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

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

Ratio Identities

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

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

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Pythagorean Identities

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

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

$1 + \cot^2\theta = \csc^2\theta$ $\quad$ $\cot^2\theta = \csc^2\theta - 1$ $\quad$ $-\cot^2\theta = 1 - \csc^2\theta$

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Write an expession for each

$\tan\theta =$

$\cot\theta =$

$\csc\theta =$

$\sec\theta =$

Write an expession for each

$\cos^2\theta$

$\sin^2\theta$

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Use Trigonometric Identities to write each expression in terms of a single term or a constant.

a. $\tan\theta\cos\theta$

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

Use Trigonometric Identities to write each expression in terms of a single term or a constant.

a. $\cos\theta\csc\theta$

b. $\frac{\sin\theta\sec\theta}{\tan\theta}$

Simplify the complex fraction.

a. $\dfrac{\frac{2}{3}}{\frac{4}{15}}$

b. $\dfrac{\frac{4}{5}}{\frac{4}{35}}$

Simplify the complex fraction.

a. $\dfrac{\frac{2}{5}}{\frac{3}{5}}$

b. $\dfrac{\frac{1}{2}}{2}$

Simplify the fraction.

a. $\dfrac{\csc\theta}{\cot\theta}$

b. $\dfrac{1-\cos^2\theta}{\tan^2\theta}$

Simplify the fraction.

a. $\dfrac{\cos\theta\sec\theta}{\tan\theta}$

b. $\dfrac{\sin\theta}{\csc\theta}$

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Use Trigonometric Identities to write each expression in terms of a single term or a constant.

a. $\cot\theta \sin\theta$

b. $\frac{1-\sin^2\theta}{\sin^2\theta}$

Use Trigonometric Identities to write each expression in terms of a single term or a constant.

a. $\sin\theta \sec\theta$

b. $\frac{\cos\theta \csc\theta}{\cot\theta}$

Simplify

a. $\dfrac{\sec\theta}{\tan\theta}$

b. $\dfrac{1-\sin^2\theta}{\cot^2\theta}$

Simplify

a. $\dfrac{\sin\theta\csc\theta}{\cot\theta}$

b. $\dfrac{\cos\theta}{\sec\theta}$

Simplify

a. $\dfrac{\tan\theta + \cot\theta}{\tan\theta}$

b. $\dfrac{\cos^2\theta}{1-\sin\theta}$

Simplify

a. $\dfrac{\sec^2\theta - 1}{\sec^2\theta}$

b. $\tan\theta \csc\theta \cos\theta$

Simplify

$$(\sin\theta - \cos\theta)(\sin\theta + \cos\theta)$$

Simplify

$$(\tan\theta + 1)^2$$

Simplify

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

Use Trigonometric Identities to write each expression in terms of a single term or a constant.

a. $\dfrac{\csc\theta - \sin\theta}{\csc\theta}$

b. $\dfrac{\sin^2\theta}{1+\cos\theta}$

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Use Trigonometric Identities to write each expression in terms of a single term or a constant.

a. $\dfrac{\csc^2\theta - 1}{\csc^2\theta}$

b. $\tan\theta \sec\theta \sin\theta$

Simplify

a. $\frac{2}{3} + \frac{1}{4}$

b. $\dfrac{1}{\cos\theta} + \dfrac{1}{\sin\theta}$

Simplify

a. $\frac{1}{1-\cos\theta} + \frac{1}{1+\cos\theta}$

b. $\tan\theta - \frac{\sec^2\theta}{\tan\theta}$

Simplify

a. $\frac{\tan\theta}{\cot\theta} + 1$

b. $\frac{1}{\cos\theta} + \frac{1}{\sin\theta}$

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Simplify

a. $\dfrac{\sin\theta}{\csc\theta} + \dfrac{\cos\theta}{\sec\theta}$

b. $\dfrac{\csc^2\theta - 1}{\cot\theta}$

Simplify

a. $\dfrac{1}{1-\sin\theta} + \dfrac{1}{1+\sin\theta}$

b. $\cot\theta - \dfrac{\csc^2\theta}{\cot\theta}$

Simplify

a. $\frac{1}{1-\sin\theta}+\frac{1}{1+\sin\theta}$

b. $\cot\theta-\frac{\csc^2\theta}{\cot\theta}$