Fundamental Identities

$2(x+3)=2x+6$

Reciprocal

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

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

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

3) $\cot\theta = \frac{1}{\tan\theta}$

Ratio

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

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

Pythagorean

6) $\sin^2\theta + \cos^2\theta = 1$

7) $1 + \tan^2\theta = \sec^2\theta$

8) $1 + \cot^2\theta = \csc^2\theta$

$\sin(-\theta) = -\sin\theta$

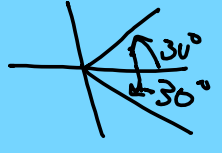
$\cos(-\theta) = \cos\theta$

$\tan(-\theta) = -\tan\theta$

$\sin(-\theta)$

$\tan(-30^\circ)$

$-\sqrt{3}/3$



Simplify.

$$\csc x \cdot \tan x$$

$$= \frac{1}{\sin x} \cdot \frac{\sin x}{\cos x}$$

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

$$= \sec x$$

$$\frac{\tan(-\theta)}{\sec\theta}$$

$$\frac{-\tan\theta}{\sec\theta}$$

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

$\sin 2x = 2\sin x \cos x$

$\sec^2 x - \tan^2 x - \cos^2 x$

$1 - \cos^2 x$

$= \sin^2 x$

7) $1 + \tan^2 x = \sec^2 x$

$1 = \sec^2 x - \tan^2 x$

6) $\sin^2 x + \cos^2 x = 1$

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

$$\tan^2 x - \frac{\sec^2 x}{\csc^2 x}$$

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

$$\frac{\sin^2 x}{\cos^2 x} - \frac{1}{\cos^2 x} \cdot \frac{\sin^2 x}{1}$$

$$\frac{\sin^2 x}{\cos^2 x} - \frac{\sin^2 x}{\cos^2 x} = 0$$

$$\frac{(1+\cos x)\cos x}{(1+\cos x)\sin x} + \frac{\sin x}{1+\cos x}\cdot\frac{(\sin x)}{(\sin x)}$$

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

$$= \frac{\cos x + 1}{\sin x(1+\cos x)}$$

$$= \frac{1}{\sin x}$$

$$= \csc x$$

Match.

B 1. $\csc^2 x - 1 = \cot^2 x$ #8

D 2. $\cos^2 x + 1$

C 3. $\frac{\tan x}{\sin x} = \frac{\frac{\sin x}{\cos x}}{\frac{\sin x}{1}} = \frac{\sin x}{\cos x} \cdot \frac{1}{\sin x} = \frac{1}{\cos x}$ #2 #5

A 4. $\sin x \sec x \cot x$

$\frac{\sin x}{1} \cdot \frac{1}{\cos x} \cdot \frac{\cos x}{\sin x}$

$= 1$

A. 1

B. $\frac{\cos^2 x}{\sin^2 x} = \cot^2 x$ #5

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

D. $\sin^2 x \cot^2 x + \sec x \cos x$

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

$= \cos^2 x + 1$

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