

Rec. prop.

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

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

$$\cot x = \frac{1}{\tan x}$$

not def. where
denominator is zero...

Quotient prop.

$$x \neq \frac{\pi}{2} + n\pi$$

$$\tan x = \frac{\sin x}{\cos x} = \frac{\sec x}{\csc x}$$

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

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

Quotient prop.

$$\cot x = \frac{\cos x}{\sin x} = \frac{\csc x}{\sec x}$$

$$x \neq n\pi$$

$$\neq 0 + n\pi$$

Pythagorean identity

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

example: transform

$\sin x \sec x \cot x$ into 1

$$\sin x \sec x \cot x$$

$$= \cancel{\sin x} \frac{1}{\cancel{\cos x}} \frac{\cancel{\cos x}}{\cancel{\sin x}} \quad \begin{array}{l} \text{rec.} \\ \text{quot.} \end{array}$$

$$= 1 \quad \text{cancel}$$

$$\therefore \sin x \sec x \cot x = 1 \quad \text{Q.E.D.}$$

method 2

$$\sin x \sec x \cot x$$

$$= \frac{1}{\cancel{\csc x}} \frac{\cancel{\sec x}}{1} \frac{\cancel{\csc x}}{\cancel{\sec x}}$$

$$= 1$$

$$\therefore \sin x \sec x \cot x = 1 \quad \text{Q.E.D.}$$

$$\frac{\sin x}{1} \quad \frac{1}{\cos x} \quad \frac{\csc x}{\sec x}$$

$$\frac{\sin x \csc x}{\cos x \sec x}$$

1

recip.
prop.

method 3

$$\sin x \sec x \cot x$$

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

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

$$= \tan x \cot x$$

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ex. 2 ^{Prove}

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

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

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Homework

p. 167 Q1-Q10 & #1, 5, 7, 27