

# FUNDAMENTAL IDENTITIES

Section 5.1A

Precalculus PreAP/Dual, Revised ©2017

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# STEPS

- A. Apply these identities**
- B. Reduce if possible**
- C. Simplify the answer to the fullest**

# EXAMPLE 1

Simplify  $\tan t \cos t$

$$\tan t \cos t$$

$$\frac{\sin t}{\cos t} \cos t$$

$$\sin t$$

# YOUR TURN

**Simplify  $\csc x \tan x$**

**$\sec x$**

# TRIG FORMALITY

Write as  $\sin^2 \theta$  as another form of trigonometry

~~$$\sin^2 \theta = (\sin^2)(\theta)$$~~

~~$$\sin^2 \theta = \sin \theta^2$$~~

$$\sin^2 \theta = (\sin \theta)^2$$

## EXAMPLE 2

Simplify  $\tan^2 \theta \cdot \cos^2 \theta + \cos^2 \theta$

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

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

$$\sin^2 \theta + \cos^2 \theta$$

**1**

## EXAMPLE 3

Simplify  $\frac{\sec^2 \theta - \tan^2 \theta}{\tan^2 \theta}$

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

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

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

$$\frac{1}{\tan^2 \theta} = \cot^2 \theta$$

## EXAMPLE 4

Simplify  $\sin\left(\frac{\pi}{2} - \theta\right) \csc \theta$

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

$$\cos \theta \cdot \csc \theta$$

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

$$\cot \theta$$



## EXAMPLE 5

**Simplify**  $\frac{\sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta}$



# YOUR TURN

Simplify  $\frac{\tan t + \cot t}{\tan t}$



# ASSIGNMENT

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**15-20 all, 21-31 odd (omit 27), 35-49 odd**