

Derivatives of Other Trig Functions

Goal:

- Understands that other trig derivatives are built from sine and cosine

Terminology:

- $\csc x, \sec x, \cot x$

Discussion: Determine the derivative of $\tan x$

Determine the derivatives of $\sec x, \csc x, \cot x$

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

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

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

Note that all “co” functions have negative derivatives and the similarities between sec/csc and tan/cot

Practice: Find the derivative $\frac{dy}{dx}$

$$y = \sec^2 x + \csc(4x)$$

Practice: Linearize the function

$$f(x) = \tan\left(\frac{1}{2}x\right) + 1$$

About the point $x = 0$

Practice: Find the two solutions to

$$x^2 = \cot x, \quad x \in (-\pi, \pi)$$

Practice: Solve the differential equation

$$\frac{dy}{dx} = \sec x \cdot \frac{\sec x + \tan x}{\sec x + \tan x}, \quad y(0) = 1$$

Practice Problems: 7.3 # 1-3 (do what you need), 4, 8, 12, 13

11.2 # 1op, 2gh

11.3 # 3e, 5