

# AP CALCULUS AB – DERIVATIVES INVOLVING THE TRIGONOMETRIC FUNCTIONS

Calculate the following derivatives.

1)

$$\frac{d}{dx}(-\cos x) = -(-\sin x) = \sin x \leftarrow$$

2)

$$\frac{d}{dx} \sin x = \cos x \leftarrow$$

3)

$$\frac{d}{dx} \ln|\sec x| = \frac{1}{|\sec x|} \cdot \frac{\sec x}{|\sec x|} \cdot \sec x \tan x = \frac{\sec^2 x}{\sec^2 x} \tan x = \tan x \leftarrow$$

4)

$$\frac{d}{dx} \ln|\sin x| = \frac{1}{|\sin x|} \cdot \frac{\sin x}{|\sin x|} \cdot \cos x = \frac{\sin x}{\sin^2 x} \cdot \cos x = \frac{\sin x}{\sin x} \cdot \frac{\cos x}{\sin x} = \cot x \leftarrow$$

5)

$$\frac{d}{dx} \ln|\sec x + \tan x| = \frac{1}{|\sec x + \tan x|} \cdot \frac{(\sec x + \tan x)}{|\sec x + \tan x|} \cdot (\sec x \tan x + \sec^2 x) =$$

6)

$$\frac{d}{dx} \ln|\csc x - \cot x| = \frac{(\sec x + \tan x)}{(\sec x + \tan x)^2} \cdot \sec x \cdot (\sec x + \tan x) = \sec x \leftarrow$$

$$\frac{1}{|\csc x - \cot x|} \cdot \frac{(\csc x - \cot x)}{|\csc x - \cot x|} \cdot (-\csc x \cot x - (-\csc^2 x)) =$$

$$= \frac{(\csc x - \cot x)}{(\csc x - \cot x)^2} \cdot \csc x \cdot (\csc x - \cot x) = \csc x \leftarrow$$