

1. Determine the following derivatives

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

$$\frac{d}{dx} \log_5(x^3 - \tan(x)) =$$

$$\frac{d}{dx} \ln(x^2 \sin(x)) =$$

$$\frac{d}{dx} \sqrt{\frac{x^2 - 1}{x \cos(x)}} =$$

$$\frac{d}{dx} x^{\sin x} =$$

2. Given $\ln 10 \approx 2.3$, estimate $\ln 11$ and $\ln 100$.

3. Calculate the following:

$$\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) =$$

$$\tan^{-1}(-1) =$$

$$\sin^{-1}(\tan(x)) =$$

4. For each of the following, determine the derivative.

$$\frac{d}{dx} \sin^{-1} x =$$

$$\frac{d}{dx} \tan^{-1} x =$$

$$\frac{d}{dx} \sec^{-1} x =$$

$$\frac{d}{dx} \cos^{-1} x =$$

$$\frac{d}{dx} \cot^{-1} x =$$

$$\frac{d}{dx} \csc^{-1} x =$$

$$\frac{d}{dx} \cos^{-1} \sqrt{x} =$$

$$\frac{d}{dx} \ln(\sec^{-1} x) =$$

$$\frac{d}{dx} \sin^{-1}(\tan x) =$$