

Name _____

Assignment #21D: *Derivatives of Trig Functions Practice #2*

1. Prove that $\frac{d}{dx}(\sec x) = \sec x \tan x$

2. Prove that $\frac{d}{dx}(\cot x) = -\csc^2 x$

Find the derivative of each of the following functions. Then check your answers on the back.

3. $y = x^2 \sin x$

4. $y = \sin^3(4x)$

5. $y = \sin[\cos(x^2)]$

6. $y = \sin^{-1}(3x-1)$

7. $y = (\tan^{-1} x)^3$

8. $y = \sec^{-1}(x^3)$

9. Find the equation of the tangent line to the graph of $y = \tan x$ at the point $\left(\frac{\pi}{4}, 1\right)$.

10. Find the equation of the tangent line to $\sin(xy) = y$ at the point $\left(\frac{\pi}{2}, 1\right)$.

Name _____

Solutions

3. $\frac{dy}{dx} = x^2 \cos x + 2x \sin x$

4. $\frac{dy}{dx} = 12 \cos(4x) \sin^2(4x)$

5. $\frac{dy}{dx} = -2x \sin(x^2) \cos[\cos(x^2)]$

6. $\frac{dy}{dx} = \frac{3}{\sqrt{-9x^2 + 6x}}$

7. $\frac{dy}{dx} = \frac{3(\tan^{-1} x)^2}{1 + x^2}$

8. $\frac{dy}{dx} = \frac{3}{|x|\sqrt{x^6 - 1}}$

9. $y = 2\left(x - \frac{\pi}{4}\right) + 1$

10. $y = 1$