

Lesson 10 Problems

September 13, 2017

1. $y = \frac{\pi - \sin x}{x^2}$

$$\begin{aligned} y' &= \frac{x^2(-\cos x) - (\pi - \sin x)(2x)}{(x^2)^2} \\ &= \frac{x(x(-\cos x) - (\pi - \sin x)(2))}{x^4} \\ &= \frac{x(-\cos x - 2(\pi - \sin x))}{x^3} \\ &= \frac{-x \cos x - 2\pi + 2 \sin x}{x^3} \end{aligned}$$

2. $y = \frac{7a}{x^2 - 1}$ where a is a constant

Notice $\frac{d}{dx}[7a] = 0$ since a is a constant.

$$\begin{aligned} y' &= \frac{(x^2 - 1)(0) - 7a(2x)}{(x^2 - 1)^2} \\ &= \frac{14ax}{(x^2 - 1)^2} \end{aligned}$$

3. $y = 3e^x \sec x$

$$\begin{aligned} y' &= 3e^x \sec x + 3e^x(\sec x \tan x) \\ &= 3e^x \sec x(1 + \tan x) \end{aligned}$$

4. $y = \frac{x}{1 + 3 \sec x}$

$$\begin{aligned} y' &= \frac{(1 + 3 \sec x)(1) - x(3 \sec x \tan x)}{(1 + 3 \sec x)^2} \\ &= \frac{1 + 3 \sec x - 3x \sec x \tan x}{(1 + 3 \sec x)^2} \end{aligned}$$