$$\frac{d}{dx}[\sec x]$$

$$\frac{d}{dx}\left[\frac{1}{\cos x}\right] \quad \begin{matrix} P & P' = 0 \\ Q & Q' = -\sin x \end{matrix}$$

$$\frac{P'Q - PQ'}{Q^2}$$

$$= \frac{0(\cos x) - 1(-\sin x)}{(\cos x)^2}$$

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

$$= \frac{\sin x}{\cos x} \cdot \frac{1}{\cos x}$$

$$= \tan x \cdot \sec x$$

FORMULAS

$$\frac{d}{dx}[\sec x] = \sec x \tan x$$

$$\frac{d}{dx}[\csc x] = -\csc x \cot x$$

$$\frac{d}{dx}[\tan x] = \sec^2 x$$

$$\frac{d}{dx}[\cot x] = -\csc^2 x$$

$$\frac{d}{dx}[e^x] = e^x$$

11. $h(x) = \frac{3}{x^2} + 5\sec x$

$$= 3x^{-2} + 5\sec x$$

$$h'(x) = 3(-2)x^{-3} + 5\sec x \tan x$$

$$= \frac{-6}{x^3} + 5\sec x \tan x$$

$$= \frac{-6}{x^3} + \frac{5\sec x \tan x}{1}$$

$$= \frac{-6}{x^3} + \frac{5x^3 \sec x \tan x}{x^3}$$

$$= \frac{-6 + 5x^3 \sec x \tan x}{x^3}$$