

Hints to some HW problems assigned on 11/19/2012

Problem 3.5/12.

$$\frac{d}{dx} \left(\frac{x}{x^2 - 9} \right) = -\frac{x^2 + 9}{(x^2 - 9)^2}$$
$$\frac{d^2}{dx^2} \left(\frac{x}{x^2 - 9} \right) = \frac{2x(x^2 + 27)}{(x^2 - 9)^3}$$

Problem 3.5/24.

$$\frac{d}{dx} \left(\sqrt{x^2 + x} - x \right) = \frac{1 + 2x}{2\sqrt{x(1+x)}} - 1, \quad \text{which is never equal to 0 ;}$$
$$\frac{d^2}{dx^2} \left(\sqrt{x^2 + x} - x \right) = -\frac{1}{4[x(1+x)]^{3/2}}$$

Problem 3.5/40.

$$\frac{d}{dx} \left(\frac{\sin x}{2 + \cos x} \right) = \frac{1 + 2 \cos x}{(2 + \cos x)^2}$$
$$\frac{d^2}{dx^2} \left(\frac{\sin x}{2 + \cos x} \right) = \frac{2(\cos x - 1) \sin x}{(2 + \cos x)^3}$$