Homework 11

3) $7\sin(xy^2) = 5 \qquad \frac{dy}{dx} = ?$

$$7\cos(xy^2)(xy^2)' = 0$$

$$7\cos(xy^2)\left(x \cdot 2y\frac{dy}{dx} + y^2 \cdot \frac{dx}{dx}\right) = 0$$

$$14xy\cos(xy^2)\frac{dy}{dx} + 7y^2\cos(xy^2) = 0$$

$$14xy\cos(xy^2)\frac{dy}{dx} = -7y^2\cos(xy^2)$$

$$\frac{dy}{dx} = \frac{-7y^2\cos(xy^2)}{2 \cdot 7xy\cos(xy^2)}$$

$$\frac{dy}{dx} = \frac{-y}{2x}$$

10) $3xe^{(x^2y^2)} = x^2 \qquad \frac{dy}{dx} = ?$

$$3xe^{(x^2y^2)}(x^2y^2)' + e^{(x^2y^2)} \cdot 3 = 2x$$

$$3xe^{(x^2y^2)}\left(x^2 \cdot 2y\frac{dy}{dx} + y^2 \cdot 2x\right) + 3e^{(x^2y^2)} = 2x$$

$$6x^3ye^{(x^2y^2)}\frac{dy}{dx} + 6x^2y^2e^{(x^2y^2)} + 3e^{(x^2y^2)} = 2x$$

$$6x^3 y e^{(x^2y^2)} \frac{dy}{dx} = 2x - 6x^2 y^2 e^{(x^2y^2)} - 3e^{(x^2y^2)}$$

$$\frac{dy}{dx} = \frac{2x - 6x^2 y^2 e^{(x^2y^2)} - 3e^{(x^2y^2)}}{6x^3 y e^{(x^2y^2)}}$$

Homework 10

1) $\frac{d}{dx}\left(15\sin(-\pi x)\tan\left(\frac{2}{8}\pi x\right)\right)$

$= 15\sin(-\pi x)\sec^2\left(\frac{2}{8}\pi x\right)\left(\frac{2}{8}\pi\right) + \tan\left(\frac{2}{8}\pi x\right) \cdot 15\cos(-\pi x)(-\pi)$

$= 10\pi\sin(-\pi x)\sec^2\left(\frac{2}{8}\pi x\right) - 15\pi\tan\left(\frac{2}{8}\pi x\right)\cos(-\pi x)$

14) $4^{\sin^2 x + \cos 3x} \Rightarrow$

$\ln 4 \cdot 4^{\sin^2 x + \cos 3x} \cdot (2\sin x \cos x - 3\sin 3x)$