Calc Pg 155
10-16-13

19) $x + \tan xy = 0$

$1 + \sec^2(xy)\left(x\frac{dy}{dx} + y(1)\right) = 0$

$1 + x\frac{dy}{dx}\sec^2 xy + y\sec^2 xy = 0$

$x\frac{dy}{dx}\sec^2 xy = -1 - y\sec^2 xy$

$* \quad \frac{dy}{dx} = \frac{-1 - y\sec^2 xy}{x\sec^2 xy}$

$= \frac{-1}{x\sec^2 xy} - \frac{y\sec^2 xy}{x\sec^2 xy}$

$\frac{-1}{x}\cos^2 xy - \frac{y}{x}$

16) $y = (\sin(x+5))^{5/4}$

$\frac{dy}{dx} = \frac{5}{4}(\sin(x+5))^{1/4}\cos(x+5)(1)$

12) $x^2 = \frac{x-y}{x+y}$

$2x = \frac{(x+y)(1-\frac{dy}{dx}) - [(x-y)(1+\frac{dy}{dx})]}{(x+y)^2}$

$2x = \frac{x - x\frac{dy}{dx} + y - y\frac{dy}{dx} - [x + x\frac{dy}{dx} - y - y\frac{dy}{dx}]}{(x+y)^2}$

$2x = \frac{x - x\frac{dy}{dx} + y - y\frac{dy}{dx} - x - x\frac{dy}{dx} + y + y\frac{dy}{dx}}{(x+y)^2}$

$2x = \frac{-2x\frac{dy}{dx} + 2y}{(x+y)^2}$

$2x(x+y)^2 = -2x\frac{dy}{dx} + 2y$

$\frac{2x(x+y)^2 - 2y}{-2x} = \frac{dy}{dx}$ *

$\frac{2x(x+y)^2}{-2x} - \frac{2y}{-2x} = \frac{dy}{dx}$

$-(x+y)^2 + \frac{y}{x} = \frac{dy}{dx}$

20) $x + \sin(y) = xy$

$1 + \cos y\frac{dy}{dx} = x\frac{dy}{dx} + y$

$\cos y\frac{dy}{dx} - x\frac{dy}{dx} = y - 1$

$\frac{dy}{dx}(\cos y - x) = y - 1$

$\frac{dy}{dx} = \frac{y-1}{\cos y - x}$

8) $y = x(x^2+1)^{-1/2}$

$\frac{dy}{dx} = x\left(-\frac{1}{2}(x^2+1)^{-3/2}(2x)\right) - \left[(x^2+1)^{-1/2}(1)\right]$

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