SI Session: June 23rd
Mondays – Thursdays
12:30 PM – 2:00 PM
Room 1229

Prof. Stockton : Calculus I
Summer I 2008
SI Leader : Neil Jody

[1] Find the derivative of each function. DO NOT simplify your answer.

(a) $f\left(x\right)=\dfrac{\sin\left(\pi x\right)}{x+3}$

(b) $f\left(x\right)=x^{5}\sec\left(\dfrac{1}{x}\right)$

(c) $f(x) = \dfrac{2x}{x^2 + 1}$

(d) $f(x) = \left(\sqrt{x} + 3x\right)\left(5x^2 - \dfrac{3}{x}\right)$

(e) $f(x) = \cos^3\left(\frac{x}{x+1}\right)$

(f) $f(x) = \sin(x)\sec(x)$

(g) $f(x) = \frac{x^2 + \tan(x)}{3x + 2\tan(x)}$

[2] Find the following derivatives using *implicit differentiation*.

(a) $\frac{d}{dx}\left[x^2 y + 3xy^3 - x = 3 \right]$

(b) $\frac{d}{dx}\left[x^2 = \frac{x+y}{x-y} \right]$

(c) $\frac{d}{dx}\left[\cos(xy^2) = y \right]$

[3] A runner starts at a point "A" and heads East at a rate of 10 ft/sec. One minute later another runner starts at "A" heading North at 8 ft/sec. At what rate is the distance between them changing 1 minute after the 2nd runner starts?

[4] Boyle's law for gases states that pv=c, for pressure p, volume v, and a constant c. At a certain instant the volume in $75\ in^3$, the pressure is $30\ lb/in^2$, and the pressure is decreasing at a rate of $2\ lb/in^2$/min. At what rate is the volume changing at this instant?