Assignment #4 ***Math 290*** ***Name:***

1. Solve the following DE:

a) $\left(2y^2e^{2x}+3x^2\right)dx+2ye^{2x}dy=0$

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

c) $\left[1+\ln\left(xy\right)\right]dx+xy^{-1}dy=0$

d) $\left(2xy+\cos y\right)dx+\left(x^{2}-x\sin y-2y\right)dy=0$

e) $\left(3x^2 \ln x + x^2 - y\right)dx - xdy = 0;\ \ y(1) = 5$

f) $\left(ye^{xy} + \cos x\right)dx + xe^{xy}dy = 0;\ y\left(\frac{\pi}{2}\right) = 0$

2. Determine an integrating factor for the given differential equation, and hence find the general solution

a) $\left(3xy-2y^{-1}\right)dx+x\left(x+y^{-2}\right)dy=0$

b) $x^2ydx+y\left(x^3+e^{-3y}\sin y\right)dy=0$