Math 324B Quiz 6: NAME_____

Hint:	$2(\cos at)(\cos bt) = \cos(a-b)t + \cos(a+b)t$ $2(\sin at)(\sin bt) = \cos(a-b)t - \cos(a+b)t$

Problem 1:

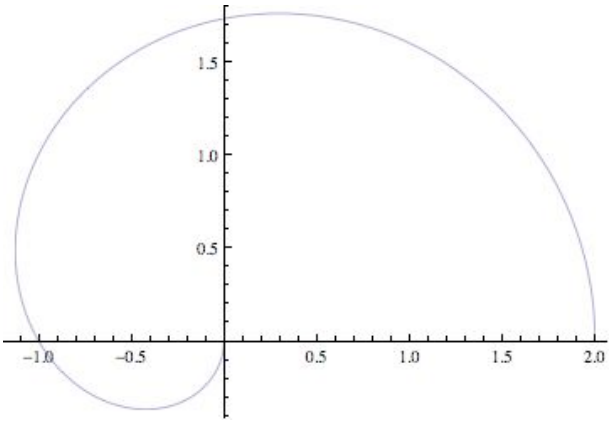
For each of these two vector fields, determine whether or not the vector field is conservative. If the vector field is conservative, find a function whose gradient equals the vector field.

(a) $F(x, y) = (y\, e^x + \sin y)\, \mathbf{i} + (e^x + x \cos y)\, \mathbf{j}$

(b) $G(x, y) = (e^x \cos y)\, \mathbf{i} + (e^x \sin y)\, \mathbf{j}$

Problem 2

This is a plot of the curve (cos t + cos 2t, sin t + sin 2t), for t on the interval $[0, \pi]$



Let D be the domain whose boundary consists of two parts, this curve and also the line segment from (0,0) to (2, 0).

(a) Set up a line integral (ready to evaluate) that will compute the area of D.

(b) Evaluate the integral (note the hint at the top of the exam).