Math 2250-1
Quiz 13
December 9, 2011

1) Consider the first order system of differential equations
$$x'(t) = y$$
$$y'(t) = -4\sin(x) - 5y.$$

1a) Find the equilbrium solutions.

(2 points)

1b) Linearize the first order system above at the equilibrium solution $(x, y) = (0, 0)$. Classify this critical point, making sure to include whether or not it is stable. (If there was more time and it was asked, could you draw a qualitatively accurate phase portrait near this point?)

(8 points)