**Name**_____

**Student I.D.**_____

**Math 2250-4**
**Quiz 12**
**April 20, 2012**

1) Find the general solution $\left[x_1(t), x_2(t)\right]^T$ to the homogeneous system of second order differential equations, which could result from two masses coupled together with springs:

$$x_1''(t) = -3x_1 + x_2$$
$$x_2''(t) = 2x_1 - 2x_2 .$$

(8 points)

2) Use Newton's second law to derive the system of differential equations above, from the configuration below. $x_1(t), x_2(t)$ are the displacements from equilibrium of two masses. The mass values and spring constants are as shown.

(2 points)