Name_____

Student I.D._____

Math 2250−1
Quiz 12
December 2, 2011

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 a "train" of two masses coupled with a single spring (in the absence of friction):

$$x_1''(t) = -4\,x_1 + 4\,x_2$$
$$x_2''(t) = 2\,x_1 - 2\,x_2\,.$$

(8 points)

2) If the Hooke's constant for the spring connecting the two cars is $k = 4000\ \frac{N}{m}$, then what are the masses of the two cars in order that their motion be governed by the system of differential equations above?

(2 points)