Name: _____

1. [**3 parts, 2 points each**] A spring/mass system is modeled by $6u'' + 7u' + 2u = \cos(\omega t)$.

   (a) Compute the normalized damping constant. Is the system overdamped, critically damped, or neither?

   (b) Compute the steady-state response $U(t)$. (Hint: use Cramer's Rule to simplify the process of solving the system of equations.)

   (c) Using part (b), compute the amplitude R of the steady-state in terms of ω.

2. [**2 parts, 2 points each**] *Trig sums.*

    (a) Express $\sin(3t) + \sin(4t)$ as the product of two trigonometric functions.

    (b) Determine all real solutions t to $\sin(3t) + \sin(4t) = 0$.