

Suggested problems: Sec. 3.5 # 3, 5, 9, 11, 17, 19, 22(a), 23(a), 25(a), 28(a); Sec. 3.6 # 3, 7, 8, 9, 12, 13, 15, 19;
 Sec. 3.7 # 2, 3, 5, 7, 11, 12, 14, 16, 17, 18, 20; 3.8 # 2, 6, 9, 12

*****Small Quiz on Friday, October 21, 2016*****

Mandatory problems:

- (1) [15 pts] Use undetermined coefficients to solve the following IVP

$$y'' + y = t(1 + \sin t); y(0) = y'(0) = 0.$$

- (2) [15 pts] Suppose $y_1 = x^2$ and $y_2 = x^2 \ln x$ are solutions to the following ODE

$$x^2 y'' - 3xy' + 4y = 0; x > 0$$

Identify the particular solution and then solve the IVP of

$$x^2 y'' - 3xy' + 4y = x^2 \ln x; x > 0; y(1) = y'(1) = 0.$$

- (3) Consider the following IVP

$$u'' + \frac{1}{4}u' + 2u = 2 \cos \omega t; u(0) = 0, u'(0) = 2.$$

- (a) [13 pts] Determine the steady state solution.
 (b) [3 pts] Find the amplitude, A , of the steady state solution in terms of ω .
 (c) [3 pts] Plot A vs. ω .
 (d) [1 pts] Find the maximum value of A and the frequency of ω for which it occurs.

Your homework raw score is: $\frac{n}{2m} \cdot M + \left(1 - \frac{n}{2m}\right) \cdot N = N + \frac{n}{2m}(M - N)$.