

Supplementary problems: Sec. 3.4 # 8, 12, 16, 18, 20; Sec. 3.5 # 8, 12, 22

Compulsory 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

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

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