MATH 334 FALL 2011 HOMEWORK 6

BASIC

INTERMEDIATE

ADVANCED

Problem 1. Solve the following equations:

a) $y''' + 2\,y'' + 9\,y' + 18\,y = 0$;

b) $y^{(4)} - 2\,y'' + 4\,y = 0$;

Problem 2. Solve the following equations:

a) $y^{(4)} - 4\,y'' = 2\,t^2$;

b) $y^{(4)} + 2\,y'' + y = 3\,t + 4$; $\qquad y(0) = y'(0) = 0, \quad y''(0) = y'''(0) = 1$.

CHALLENGE

ANSWERS

- Problem 1.

  a) $y = C_1 e^{-2t} + C_2 \cos 3t + C_3 \sin 3t$.

  b) $y = C_1 e^{\frac{\sqrt{6}}{2}t} \cos \frac{\sqrt{2}}{2} t + C_2 e^{\frac{\sqrt{6}}{2}t} \sin \frac{\sqrt{2}}{2} t + C_3 e^{-\frac{\sqrt{6}}{2}t} \cos \frac{\sqrt{2}}{2} t + C_4 e^{-\frac{\sqrt{6}}{2}t} \sin \frac{\sqrt{2}}{2} t$.

- Problem 2.

  a) $y = C_1 + C_2 t + C_3 e^{2t} + C_4 e^{-2t} - \frac{t^2}{8} - \frac{t^4}{24}$.

  b) $y = -4 \cos t - 4 \sin t + t \cos t - \frac{3}{2} t \sin t + 3t + 4$.