

PROBLEM SET #6 (Part One)

For each given homogeneous linear differential equation $L(y)=0$ with constant coefficients

(a) write down the characteristic polynomial $P(\lambda) = a\lambda^2 + b\lambda + c$ associated to the operator $L = aD^2 + bD + cI$

(b) factor $P(\lambda)$ to find the "characteristic" roots

(c) write down the general solution of $L(y)=0$

(d) solve the given initial value problem $L(y)=0, y(0)=b_0, y'(0)=b_1$

$$\textcircled{1} y'' + y' + 0y = 0, y(0) = 1, y'(0) = \frac{-1}{2}$$

$$\textcircled{2} y'' + 0y' - y = 0, y(0) = 1, y'(0) = 0$$

$$\textcircled{3} y'' + 2y' - 8y = 0, y(0) = 3, y'(0) = 5$$

All numbers must be exact. Do not use decimals.

TO BE CONTINUED