

$$n=2 \quad a_1 = -1 \quad a_0 = -2 \quad f(t) = 3 \quad y(0) = 2 \quad \dot{y}(0) = 0$$

$$\ddot{y} - \dot{y} - 2y = f(t) = 3$$

$$\lambda^2 - \lambda - 2 = 0 \quad \lambda = 2, -1$$

$$y_h = C_1 e^{2t} + C_2 e^{-t}$$

$$y_h(0) = 2 = C_1 + C_2$$

$$\dot{y}_h = 2C_1 e^{2t} - C_2 e^{-t}$$

$$\dot{y}_h(0) = 0 = 2C_1 - C_2$$

$$y_p = k \quad \dot{y}_p = 0 \quad \ddot{y}_p = 0$$

$$-2k = 3 \Rightarrow k = -\frac{3}{2}$$

$$y_g = y_h + y_p = C_1 e^{2t} + C_2 e^{-t} - \frac{3}{2}$$

$$\left. \begin{array}{l} y(0) = 2 = C_1 e^{2t} + C_2 e^{-t} - \frac{3}{2} \\ \dot{y}(0) = 0 = 2C_1 e^{2t} - C_2 e^{-t} \end{array} \right\} \text{Solve these} \\ \text{eq's to find} \\ C_1 \text{ and } C_2$$