

IRANMOBA ELIZABETH + AMANDA
 15/ENG 31016
 ENG 381

$$\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 5y = 6\sin t$$

$$\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 5y = 0$$

$$m^2 + 4m + 5 = 0$$

$$-b \pm \sqrt{b^2 - 4ac}$$

$$2a$$

$$\frac{-4 \pm \sqrt{4^2 - 4(1)(5)}}{2(1)}$$

$$\frac{-4 \pm \sqrt{16 - 20}}{2}$$

$$2$$

$$\frac{-4 \pm \sqrt{-4}}{2}$$

$$2$$

$$\frac{-4 \pm j2}{2}$$

$$2$$

$$-2 \pm j$$

C.F.

$$y = e^{-2t}(A \cos t + B \sin t)$$

P.I.

$$y = C \cos t + D \sin t$$

$$\frac{dy}{dt} = -C \sin t + D \cos t$$

dt

$$\frac{d^2y}{dt^2} = -C \cos t - D \sin t$$

$$-C \cos t - D \sin t + 4(-C \sin t + D \cos t) + 5(C \cos t + D \sin t) = 6 \sin t$$

$$-C \cos t - D \sin t + 4C \sin t + 4D \cos t + 5C \cos t + 5D \sin t = 6 \sin t$$

$$-C \cos t + 4D \cos t + 5C \cos t - D \sin t - 4C \sin t + 5D \sin t = 6 \sin t$$

$$C \cos t (-C + 4D + 5C) + 5 \sin t (-D - 4C + 5D) = 6 \sin t$$

comparing coefficients.

$$-C + 4D + 5C = 0$$

$$-D - 4C + 5D = 6$$

$$4D + 4C = 0 \quad \text{--- (i)}$$

$$-4C + 4D = 6 \quad \text{--- (ii)}$$