

HOMWORK 14

1. Find the general solution to the following ODEs

(a)  $y'' + 2y' + y = 5$

(b)  $y'' - 5y' + 6y = t + 6$

(c)  $y'' - 5y' + 6y = te^t$

(d)  $y'' + y = e^t$

(e)  $y'' + y = 3 \sin 2t + 6 \cos 2t$

2. Find the general solution to the following ODEs.

(a)  $y'' - 5y' + 6y = e^{3t}$

(b)  $y'' + y = \sin t$

(c)  $y'' + 2y' + y = te^{-t}$

(d)  $y'' + 2y' - 3y = e^{-3t} + \sin 2t$

3. Let  $\omega_0$  be a constant real number and let  $\omega$  be another constant real number with  $\omega \neq \omega_0$ .

Solve the following IVPs

(a)  $y'' + \omega_0^2 y = \cos \omega t, y(0) = 0, y'(0) = 0$

(b)  $y'' + \omega_0^2 y = \cos \omega_0 t, y(0) = 0, y'(0) = 0$