

1. By using the eigenfunction expansion, solve

$$y''(t) + 4y(t) = \cos(2t)$$

where

$$\mathcal{L}(y) = y'' + 4y = \lambda y$$

$$\lambda_n = 4 - n^2$$

$$y_n(t) = \cos(nt) \text{ or } \sin(nt)$$