1. Find the general solution for the equations:
   
   (a) \( u^{(3)} + 3u'' + 3u' + u = 5 \)
   
   (b) \((D - 1)(D^2 + 4)y = 2t\), where \(Dy = y'\).

2. Find the solutions for the DE \(x'' + mx = 0\) depending on all possible real values of \(m\).

3. Use the half-angle formulae:
   
   \[
   \sin^2 t = \frac{(1 - \cos 2t)}{2}, \quad \cos^2 t = \frac{(1 + \cos 2t)}{2}
   \]
   
   to solve the following IVPs:

   (a) \(2y'' + 8y = 4\sin^2 t, \quad y(\pi) = 0, \quad y'(\pi) = 1\)

   (b) \(z'' + 4z' + 4z = \cos^2 t, \quad z(0) = 2, \quad z'(0) = 0\).