1. Find the general solution for the following, assume $t > 0$.

   \[(a) \ t^2y'' - ty' + y = 0 \hspace{1cm} (b) \ t^2y'' + ty' + 4y = 0 \]

2. Solve the initial value problem

   \[t^2y'' - 6y = 0, \quad y(1) = 1, \quad y'(1) = 8.\]

3. Use the table provided to compute the following Laplace transforms.

   \[(a) \ \mathcal{L}\{e^{2t} \sin 3t + 6t^4\}\]

   \[(b) \ \mathcal{L}\{8 - 2e^{-t} \cos 7t\}\]