1. (15 pts) Use variation of parameters to find a particular solution to

\[ t^2 y'' - 2y = 3t^2 - 1, \quad t > 0 \]

using the fact that \( y_1 := t^2 \) and \( y_2 := t^{-1} \) are solutions to the corresponding homogeneous equations. **Careful at step 1!** You have plenty of time so work carefully, and slowly, and make sure to double check each step before proceeding.
2. (5 pts) Solve the problem

\[ t^2 y'' - 2y = 3t^2 - 1, \quad t > 0, \quad y(1) = 0, \quad y'(1) = 1. \]