3. [14 points] Use Laplace transforms to solve each of the following.

a. [7 points] \( y'' + 4y' + 4y = 2e^{-2t}, \ y(0) = 1, \ y'(0) = 0. \)

b. [7 points] \( y'' + 3y' = \begin{cases} 
12, & 0 \leq t < 2 \\
0, & t \geq 2 
\end{cases} \), \( y(0) = 0, \ y'(0) = 0. \)