1. (5) Using its definition compute the Laplace transform of

\[ f(t) = \begin{cases} 
0, & 0 \leq t < 2 \\
1, & 2 \leq t \leq 4 \\
0, & 4 < t 
\end{cases} \]

2. (5) Suppose \( y(t) \) satisfies the initial value problem

\[
\frac{d^2 y}{dt^2} - 3 \frac{dy}{dt} + 2y = e^{2t} \\
y(0) = 2 \\
y'(0) = -1
\]

What must the Laplace transform of \( y \) equal?