The Laplace Transform and the Inverse Laplace Transform (5.1 - 5.4)

Solve $y''(t) + 5y'(t) + 4y(t) = e^t, y(0) = 2, y'(0) = -1$, using the Laplace transform method.

Discontinuous Functions (5.5)

Find the Laplace transforms of the following functions.

1. $f(t) = \begin{cases} 0, & t < 7, \\ (t-7)^3, & t \geq 7. \end{cases}$

2. $f(t) = u(t-2)\Big[7(t-2)^3 + 9(t-2)^2 e^{4(t-2)}\Big]$.

3. $f(t) = u(t-3)t^2 - 5u(t-7)\Big(3t + 8e^{-2t}\Big)$.