1) Find the Laplace transform of $f(t) = t$ by hand.

2) Find the Laplace transform of $f(t) = u(t - 3)$ by hand.

3) Find the Laplace transform of the solution to the following differential equation. Note that this means that you need not find the solution at this time. Do this completely by hand and show all steps. $y' - 3y = 9$, $y(0) = 12$.

4) Using the table on page 132 in the notes, find the inverse Laplace transforms of the following functions: $\frac{4}{s - 5}$, $\frac{3s}{s^2 + 5}$, $\frac{2e^{-2s}}{s}$

5) Derive the formula for the Laplace transform of $f''(t)$. (again see the table for the answer).

6) Find the inverse Laplace transforms of $\frac{1}{s^2 - 2s}$ and $\frac{3}{s^2 + 3s + 2}$. 