Laplace Transforms : Tutorial Sheet 1

For all of the questions on this worksheet, you may assume $t > 0$. You may need to state this assumption in a written examination.

1. Using the tables, state the Laplace Transform of the following expressions:

   (a) $f(t) = t^6$
   (b) $f(t) = e^{2t}$
   (c) $f(t) = e^{3t} + e^{-2t}$
   (d) $f(t) = \sinh(t)$

2. Using the tables write down the transforms of the following functions

   (a) $2t^2$
   (b) $2t + 1$
   (c) $3\sin(2t)$
   (d) $3e^{-t}$

3. Using the tables write down the transforms of the following functions

   (a) $(t-2)^2$
   (b) $2t - 2$
   (c) e^{2t-2}
   (d) $t + \sinh(t)$

4. Using the tables write down the transforms of the following functions

   (a) $t^2 - 3t + 4$
   (b) $2\cos(t) + 3\sin(2t)$
   (c) $4e^t - e^{-2t}$
   (d) $(t^2 - 3)^2$
   (e) $2\cos tt$
   (f) $e^{-t}(e^{2t} + 2et)^2$
   (g) $4\sin t\cos t$
   (h) $1 - 4\sin(t)$

5. Calculate the Laplace transform of the following functions directly from the definig formula.

   (a) $2t^2$
   (b) $3\sin(2t)$
   (c) $3e^{-t}$
   (d) $\sinh(3t)$