Homework 13

Instructions: Complete each of the following on separate, stapled sheets of paper.

1. Use the definition of the Laplace transform to compute $\mathcal{L}\{f(t)\}$ for each function below.

   (a) $f(t) = e^{t+7}$

   (b) $f(t) = e^{-t}\sin(t)$

   (c) $f(t) = t\cos(t)$

   (d) $f(t) = t^2 e^{-2t}$

2. Compute the Laplace transform of the following functions using the table of Laplace transforms.

   (a) $f(t) = 2t^4$

   (b) $f(t) = 7t^5 + 3t$

   (c) $f(t) = (e^t + e^{-t})^2$

   (d) $f(t) = \cos(5t) + \sin(3t)$

3. Compute the inverse Laplace transform for each of the following functions $F(s)$.

   (a) $F(s) = \dfrac{1}{s^3}$

   (b) $F(s) = \dfrac{(s+1)^3}{s^4}$

   (c) $F(s) = \dfrac{2s-6}{s^2+9}$

   (d) $F(s) = \dfrac{1}{s^2+s-20}$

   (e) $F(s) = \dfrac{1}{s^3+5s}$

   (f) $F(s) = \dfrac{s-3}{s^2-3}$