MAP 2302 Elementary Ordinary Differential Equations

Homework Assignment # 8, Due March 30, 2016

1) Find the inverse Laplace transform of the following functions:
   a. $5/(s-2)^4$
   b. $1/(s^3+4s^2+3s)$
   c. $(e^2e^{-4s})/(2s-1)$

2) Solve the initial value problem $y''+4y=\delta(t-\pi)-\delta(t-2\pi),\ y(0)=0,\ y'(0)=0$, using Laplace transforms.

3) Solve the initial value problem $y''+4y=g(t),\ y(0)=0,\ y'(0)=0$, where

$$g(t)=\begin{cases}\sin t, & 0\le t<2\pi,\\ 0, & t\ge 2\pi,\end{cases}$$

using Laplace transforms.

4) Solve the initial value problem $y''-y=\delta(t)+\delta(t-1),\ y(0)=0,\ y'(0)=3$, using Laplace transforms.

5) Find the solution of the ODE $y^{(4)}+6y''+8y=1-u_\pi(t)$, with initial conditions $y(0)=1,\ y'(0)=0,\ y''(0)=0,\ y'''(0)=0$.

Also from the text:

Section 7.1: Problems 11–39 (odd)

Section 7.2: Problems 1-41 (odd)

Section 7.3: Problems 1-33 (odd)

Section 7.4: Problems 1–13 (odd)

Section 7.5: Problems 1–13 (odd)