King Fahd University of Petroleum & Minerals

Department of Mathematics and Statistics

Semester II, 2012/2013 (122)

Math 513.02, Dr. Rajai S. Alassar

Homework Assignment No. 3

1. Find the Laplace transform of $f(t)=\begin{cases} -4 & if \quad 0\le t<1 \\ 0 & if \quad 1\le t<3 \\ e^{-t} & if \quad t\ge 3 \end{cases}$.

2. Find the Laplace transform of $f(t)=(t^4+2t^2+t)e^{-5t}\cos(3t)$.

3. Find the inverse Laplace transform of $F(s)=\dfrac{1}{s(s^2+16)}e^{-21s}$.

4. Solve the differential equation $y"+16y=1+t;\ y(0)=-2;\ y'(0)=1$.

5. Solve the integral equation $f(t)=e^{-3t}\left[e^t-3\int_0^t f(x)e^{3x}\,dx\right]$