Math 2280 HOMEWORK #11 Name:

Due 4/5/2024, 9:30 A.M.

Solve the following problems and staple your solutions to this cover sheet. (Computer outputs must be put in the appropriate place in the solution, not attached as an appendix. You may physically cut and paste the output in the problem or allow appropriate space in the printout to add your hand written work.)

1. Sec 7.5 #4
2. Sec 7.5 #10
3. Sec 7.5 #29
4. Sec 7.6 #5
   Hint: Only use unit step functions, not rectangular window functions.
5. Sec 7.6 #8
   Hint: $\mathscr{L}\{u(t-a)g(t)\} = e^{-as}\mathscr{L}\{g(t+a)\}$.
6. Sec 7.6 #29
   Hint: You may graph the solution using Mathematica.
7. Sec 7.8 #5
8. Sec 7.8 #17
   Hint: You may use Mathematica to perform partial fraction decomposition.
9. Sec 7.8 #22
   Hint: You may graph the solution using Mathematica.
10. Free points!

Mathematica Commands

The Mathematica command for the partial fractions is `Apart`: `Apart[`expression`]`.

A piecewsie defined function can be inputted using the `Piecewise` command;

`f[x_]:=Piecewise[{ {`$f_1(x)$, $a_1 < x < b_1$`}, {`$f_2(x)$, $a_2 < x < b_2$`}, ` $\cdots$ `  } ]`

is the function $f(x) = \begin{cases} f_1(x)\,, & a_1 < x < b_1 \\ f_2(x)\,, & a_2 < x < b_2 \\ \vdots \end{cases}$.

The Mathematica notation for the unit step function $u(t-a)$ is `UnitStep[t-a]`.