

Math 23 Diff Eq: Homework 4—revised

due Wed Oct 24

Sections 3.6 and 3.7 are the key parts to focus on this week, and might require a bit more time since each is a new technique—be sure to attack them early!

3.5: 3, 14,

16,

21 (nice intuitive way to see why te^{rt} arises).

The next section suddenly involves more messy algebra (be prepared to keep track of lots of terms—I suggest the bookkeeping trick from lecture—use abbreviations to help, *e.g.* s and c for $\sin \beta t$ and $\cos \beta t$). The results are worth it though!

3.6: 1 (is e^{2t} a homog soln?),

2,

3 (is e^{-t} a homog soln? Use this info),

4,

14.

The next technique is equally crucial, but mainly boils down to evaluating two integrals each time:

3.7: 3 (important to get the two methods to agree— isn't it amazing how the t^2 term emerges from variation of parameters?),

5 (look in integral table),

11 (simplify as much as you can),

13 (don't forget you can remove multiples of y_1 and y_2 , the homog solns, in the answer, and careful choosing lower limit t_0),

23 (beautiful result for response of driven harmonic oscillator).

3.8: 1,

7,

17.

3.9: 1,

17 (plot can be replaced by sketch but be sure to label some values, width/height of peak, etc)