Exam Coordinates: Friday, December 16, 12:00-2:00pm, 302 Keller

Disclaimer: This is a list of topics and problems to point you in the right direction with your studying for the new material. I make no claims that it is a complete study guide, but it will help you to prepare. Do not forget to review the material from the first three midterms as well. (See the other study guides posted for those exams.)

Chapter 9: Taylor and Maclaurin series, Taylor polynomials, Taylor’s formula and the remainder estimation theorem (pp.552–553), how to find the Taylor series (standard forms below, differentiation, integration, ...)

In particular, be sure to know the following formulas:

\[
\frac{1}{1-x} = \sum_{n=0}^{\infty} x^n \quad |x| < 1 \\
e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!} \quad -\infty < x < +\infty \\
cos x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} \quad -\infty < x < +\infty \\
sin x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!} \quad -\infty < x < +\infty \\
ln(1+x) = \sum_{n=1}^{\infty} \frac{(-1)^{n-1} x^n}{n} \quad -1 < x \leq 1 \\
(1+x)^r = 1 + \sum_{n=1}^{\infty} \binom{r}{n} x^n \quad -1 < x < 1, \ r \text{ any real number}
\]

Review problems: Chapter 9 Practice Exercises, pp.565–566 — #41–47, 51, 53, 57, 63, 67, 73(a), 75(a), p.564 #15

Chapters 16/17: Solutions to differential equations, slope fields, how to solve first order linear differential equations, how to solve second order linear homogeneous differential equations, superposition principle

Review problems: Chapter 16.1, p.16–8 #2, 4, 6, 8, 10

Chapter 16.2, p.16–17, #4, 9, 12, 13, 16, 18 (remember that you can check your solution by substituting it back into the original differential equation)

Chapter 17.1, p.17–7 — #41–59 odd