Math 2423 homework

47. Unless you absolutely do not have time, spend a similar session (on a different day) with the problems in Section 8.6. Transform them to a general form that is in the tables, but do not bother to go on from there. For example, in # 29 the substitution $u = x^5$ reduces it to something of the general form $\int \frac{1}{\sqrt{u^2-(\sqrt{2})^2}}\,du$, which is number 43 in the book's tables, so stop there and move to another.

48. Read the discussion on Simpson's Rule on pp. 536-540 of the book, focusing in particular on the error estimates in Examples 6 and 7. There is no need to spend a lot of time on this topic, we just want to get the "flavor" of this important domain of mathematical thinking.

49. 8.7 # 21(c) (Simpson's rule only), 44

50. For $0 < p$, verify that $\displaystyle\int_1^\infty \frac{1}{x^p}\,dx$ converges if and only if $p > 1$.

51. 8.8 # 7, 8, 26, 63, 71(a)(b), 77 (to save time, you can use the formula $\displaystyle\int \frac{1}{\sqrt{a^2+u^2}}\,du = \ln(u+\sqrt{a^2+u^2}) + C$ from the table). Number 78 is similar to 77, you can do it if you want to reinforce what you learned in 77.

52. 8.8 # 34, 36, 49, 51 (integral is improper at both ends, regard it as $\displaystyle\int_1^2 \frac{x+1}{\sqrt{x^4-x}}\,dx + \int_2^\infty \frac{x+1}{\sqrt{x^4-x}}\,dx$, note that $\displaystyle\frac{x+1}{\sqrt{x^4-x}} > \frac{x}{\sqrt{x^4}}$), 53, 54

53. 9.1 # 13, 14, 41

54. 9.2 # 5, 8, 14