# Homework Assignment for Chap 08

1. Section 8.1: Problems: 3, 7, 19, 23, 29, 33, 35 39, 41, 45, 57, 61, 63, 65, 67, 80 (try as many substitutions as time permits, but at least two).

   Hint for problems 61-66: Multiply appropriate factor on the numerator and denominator simultaneously. For example, $\sec\theta - \tan\theta$ for Problem 63.

2. Section 8.2: Problems: 7, 9, 13, 19, 25, 27, 29, 30, 43, 47.

   Hint for Problem 29: read Example 6.

3. Section 8.3: Problems: 11, 15, 17, 19, 33, 35, 39, 41, 42, 43.

   Hint for Problem 41, 42: break the square root and cubic root by a proper change of variable.

4. Apply integration by parts procedure twice to obtain general reduction formula from $\int \sin^{2p}(x)\cos^{2q}(x)dx$ to $\int \sin^{2p-2}(x)\cos^{2q}(x)\,dx$ and to $\int \sin^{2p}(x)\cos^{2q-2}(x)\,dx$ and check your answer with the formula on the integration table at the end of the textbook.

5. Do the same for the integral $\int \tan^m(x)\sec^n(x)\,dx$ using the formula $d\tan(x) = \sec^2(x)\,dx$ and $d\sec(x) = \tan(x)\sec(x)\,dx$. There are four cases depending on whether $m$, $n$ is even or odd, respectively. You should be able to turn it into polynomial integration for three cases. Then work out the reduction formula for the remaining case as in Problem 4.

6. Section 8.4: Problems: 3, 5, 9, 13, 14, 39, 43.

7. Check if the improper integrals $\int_0^1 x^{-p}dx$ and $\int_1^\infty x^{-p}dx$ converge for the cases $p > 1$, $p = 1$ and $0 < p < 1$, respectively by direct evaluation. Then memorize the results.

8. Section 8.6: Problems: 7, 13, 21, 25, 31, 33, 34, 37, 38, 41, 51, 54, 55, 56, 58, 60, 64, 71, 73.

   You may find it convenient to use Theorem 1 and Theorem 2 for almost all of the problems. Simply compare the integrand with one of the cases in Problem 7 above.

9. Chap 8: Pick as many as time permits among problems 129-194. This is an efficient way of reviewing all the techniques you learned from this Chapter.