Study guide for Final Exam

Review the study guides for quiz 09 - quiz 11. They are all relevant for Final Exam.

1. Section 8.3: Which of the integrals $\int \sin^m x \cos^n x \, dx$ can be integrated directly? (m, n even or odd?) Which of them requires integration by parts twice to reduce m or n? (m, n even or odd?) See also the table on page 484.

2. Section 8.3: Memorize the identity (2) in the table on page 484 (double angle formula) and identities (3), (4), (5) on page 487 (Products of Sines and Cosines) to be used for for small even numbers m and n.

3. Section 8.4: Study which trigonometric substitution to be used for $a^2 + x^2$, $a^2 - x^2$ and $x^2 - a^2$, respectively. Study the corresponding range of θ to determine the signs of $\sqrt{\cos^2 \theta}$, $\sqrt{\tan^2 \theta}$, $\sqrt{\sec^2 \theta}$, etc. when they emerge. Study how to complete a square such as $4x^2 - x$, $x^2 + x + 1$, etc.

4. Section 8.5: Study the summary on page 495 and how to find the numbers A_i's, B_j's and C_j's.

5. Chapter 8: Study the "half-angle substitution" $z = \tan(\frac{x}{2})$ and problems 41-50 on page 547-548.

6. Chapter 8: If time permits, practice Chap 8, Practice Exercises problems 69-115 on page 545 as an overall review of the techniques of integration. Also note the techniques given in the Hints of homework 13 and 14.