I will give you the following formulas on Friday's test...

$$\int \frac{1}{1+x^2}\,dx = \operatorname{atan}(x) + C \qquad \int \frac{1}{\sqrt{1-x^2}}\,dx = \operatorname{asin}(x) + C \qquad \int \sec^2(x)\,dx = \tan(x) + C$$

$$|I - L_n|, |I - R_n| \leq \frac{K_1(b-a)^2}{2n} \qquad |I - T_n| \leq \frac{K_2(b-a)^3}{12n^2} \qquad |I - M_n| \leq \frac{K_2(b-a)^3}{24n^2}$$

Some review problems/suggestions...

- Find the arc length of $y = x^{3/2}$ where $0 \leq x \leq 3$.
- Consider the integral $I = \int_0^4 3x^2\,dx$. Compute the error bounds (formulas are given above) for L_n, R_n, M_n, and T_n. For each method (L_n, R_n, M_n, and T_n), determine the smallest choice of n so that the absolute error is no more than 1. Repeat this for absolute error no more than 1/4.
- Of course, you should know how to interpret definite integrals as signed areas (above the x-axis = "+" and below the x-axis = "−").
- You should know properties of integrals like those found on pages 306, 307, 311.
- We did 5.3 #15 in class. Problems #9-#18 are good review problems dealing with the Fundamental Theorem of Calculus. See especially #11, #13, #16.
- Know substitution: 5.4 #23, #29, #35, #45, #51, #57. Also, know substitution for definite integrals: 5.4 #69, #71, #73
- Know how to approximate using L_n, R_n, T_n, M_n, and S_{2n}.
- Know whether you have over/under estimates depending on properties of your integrand.
- Know how to use the error bounds.
- Be able to interpret limits of sums as integrals. Like 5.7 #39, #41, #42
- Area bounded by curves: 7.1 #13, #15, #19
- Arc length: 7.1 #7 (this also gives you some practice with M_n approximations), #8, #43
- Understand your quizzes! Try extra suggested homework coming from things that give you trouble. Review your notes and examples from class.