Due Monday, September 17.

1. Evaluate $\int e^x \cos x \, dx$.

2. Evaluate $\int_1^3 \ln(2x + 1) \, dx$.

3. Evaluate $\int (\ln x)^2 \, dx$.

4. Evaluate $\int \sin(\sqrt{x}) \, dx$. (Hint: use substitution and then integration by parts.)

5. Evaluate $\int x^5 e^x \, dx$. (Hint: use substitution and then integration by parts.)

6. Use integration by parts to prove that $\int x^n e^x \, dx = x^n e^x - n \int x^{n-1} e^x \, dx$.
   Check your answer by taking the derivative.