

## 7.1 HW

Instructor: Wesley Pegden

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Due Monday, September 17.

1. Evaluate  $\int e^x \cos x dx$ . Answer:  $\frac{e^x(\sin(x)+\cos(x))}{2} + C$ .
2. Evaluate  $\int_1^3 \ln(2x+1)dx$ . Answer:  $2 \ln 7$ .
3. Evaluate  $\int (\ln x)^2 dx$ . Answer:  $x(\ln x)^2 - 2x \ln x + 2x + C$
4. Evaluate  $\int \sin(\sqrt{x})dx$ . (Hint: use substitution and then integration by parts.) Answer:  $2(\sin \sqrt{x} - \sqrt{x} \cos \sqrt{x}) + C$
5. Evaluate  $\int x^5 e^{x^2}$ . (Hint: use substitution and then integration by parts.) Answer:  $\frac{1}{2}x^4 e^{x^2} - x^2 e^{x^2} + e^{x^2} + C$ .
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.