Math 311 — Homework 1

September 3, 2008

Instructions.

Provide complete solutions to the following problems. Show all work. Do not use tables or symbolic manipulation packages to simplify your computations. Be sure to make clear which integration technique(s) you have used.

1. $\int_1^3 \frac{1}{x^4\sqrt{x^2+3}}dx$
2. $\int_{7/4}^4 x\sqrt{4x-7}dx$
3. $\int_0^1 \frac{x^2}{4}\sqrt{4x^3+5}dx$
4. $\int e^{-x}\cos(2x)\,dx$
5. $\int_0^\infty \frac{x}{9}e^{-x/9}dx = \mathrm{E}(X)$
6. Find the area of the region that is enclosed by $y = \frac{x-3}{x^3+x^2}$, $y = 0$, $x = 1$, and $x = 2$.
7. $\int \frac{x^3}{x^2-3x+2}dx$
8. $\int_{-2}^1 \frac{1}{x^2+4x+5}dx$
9. $\int \frac{1}{4+4\sqrt{x}}dx$
10. $\int \frac{x^3}{\sqrt{2-x^2}}dx$