

Homework #1

(Due February 2)

Directions: Write up your solutions to the following problems as completely and neatly as possible. Remember, this is to help make sure you get enough practice writing up solutions well, so among other things don't forget any differentials, arbitrary constants, or parentheses.

If you want to know what many scientists use to type mathematics, look up \LaTeX online.

INTEGRATION BY PARTS

2. $\int 5x \sec^2 9x \, dx$

4. $\int_1^2 \frac{9(\ln x)^2}{x^3} \, dx$

7. $\int x^3 e^{-x^2} \, dx$

8. $\int_0^\pi e^{\cos x} \sin 2x \, dx$

9. $\int 25 \sin(\ln x) \, dx$

TRIG. INTEGRALS

4. $\int_0^\pi 69 \sin^2 x \cos^4 x \, dx$

5. $\int \frac{\cos^5 x}{\sqrt{\sin x}} \, dx$

6. $\int_0^{\pi/2} 27 \sec^4(x/2) \, dx$

10. $\int 59 \tan^2 x \sec x \, dx$

12. $\int \frac{69 \, dx}{\cos x - 1}$

TRIG. SUBSTITUTION

1. $\int_{3\sqrt{2}}^6 \frac{dx}{x^3 \sqrt{x^2 - 9}}$

4. $\int \sqrt{40 + 6x - x^2} \, dx$

5. $\int \frac{9x \, dx}{\sqrt{x^2 + x + 1}}$

6. $\int \frac{x^2 \, dx}{(15 + 6x - 9x^2)^{3/2}}$

8. $\int 7x \sqrt{1 - x^4} \, dx$

RATIONAL FUNCTIONS

3. $\int \frac{x^3 + 1}{x^2 + 9} \, dx$

4. $\int \frac{34 \, dx}{(x - 5)(x^2 + 9)}$

5. $\int \frac{x^2 + 5x + 1}{(x^2 + 1)^2} \, dx$

6. $\int \frac{7 \, dx}{x^3 - 1}$

11. $\int \frac{e^x \, dx}{(e^x - 9)(e^{2x} + 16)}$