

Math 119 Recitation 9

November 16, 2006

1. Use mid-point rule to approximate $\int_1^5 \frac{x-1}{x+1} dx$ with $n = 4$.
2. Express the limit $\lim_{n \rightarrow \infty} \sum_{i=1}^n x_i \sin x_i \Delta x$ on $[0, \pi]$ as a definite integral.
3. Use formal definition of integral to evaluate $\int_{-1}^5 (1 + 3x) dx$.
4. Prove that $\int_a^b x dx = \frac{b^2 - a^2}{2}$.
5. Find the derivative of $g(u) = \int_0^u \frac{1}{x+x^2} dx$.
6. Evaluate the following integrals or show that they do not exist:
 - (a) $\int_{-5}^5 \frac{2}{x^3} dx$.
 - (b) $\int_0^1 (3 + x\sqrt{x}) dx$.
7. Find the following integrals:
 - (a) $\int (u^2 + 1 + \frac{1}{u^2}) du$.
 - (b) $\int \frac{\sin x}{1 - \sin^2 x} dx$.
 - (c) $\int [\sqrt{t}(1+t)] dt$.
 - (d) $\int \frac{y+5y^7}{y^3} dy$.
 - (e) $\int_{-1}^2 (x - 2|x|) dx$.
 - (f) $\int \frac{1+4x}{\sqrt{1+x+2x^2}} dx$.
 - (g) $\int \frac{x}{(x^2+1)^2} dx$.
 - (h) $\int \frac{\cos(\sqrt{t})}{\sqrt{t}} dt$.
 - (i) $\int \sqrt{x} \sin(1 + x^{3/2}) dx$.
 - (j) $\int_0^7 \sqrt{4+3x} dx$.