
21-120: Differential and Integral Calculus
Recitation #22 Outline: 11/19/24

1. Evaluate each indefinite integral.

(a) $\int \frac{(\ln x)^2}{x} dx$

(b) $\int \sin x \sin(\cos x) dx$

(c) $\int \frac{x^2}{x^3 + 1} dx$

2. Evaluate each definite integral.

(a) $\int_0^1 \frac{e^x + 1}{e^x + x} dx$

(b) $\int_0^3 \frac{dx}{5x + 1}$

(c) $\int_0^4 \frac{x}{\sqrt{2x + 1}} dx$

3. Let f be an everywhere-continuous function.

(a) Find $\int_0^2 f(2x) dx$ knowing that $\int_0^4 f(x) dx = 10$.

(b) Find $\int_0^3 xf(x^2) dx$ knowing that $\int_0^9 f(x) dx = 4$.

4. Let f be an everywhere-continuous function. Show that

$$\int_0^a x^3 f(x^2) dx = \frac{1}{2} \int_0^{a^2} xf(x) dx$$

for any $a > 0$.