

Math 170: Worksheet 4

Sayan Mukherjee's discussion

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Problem 1. Compute the indefinite integral $\int 2^{\sqrt{x}} dx$.

Problem 2. Recall the formula for integration by parts:

$$\int f(x)g'(x) dx = f(x)g(x) - \int f'(x)g(x) dx.$$

For each of the integrals below, what would you choose as your integrating function (g') and differentiating function (f)?

- (a) $\int x^3 e^{3x} dx$
- (b) $\int x^3 \sin 2x dx$
- (c) $\int e^{2x} \sin 4x dx$
- (d) $\int \sec^3 x dx$

Problem 3. Compute the following integrals using substitution (and maybe integration by parts after substitution):

- (a) $\int \sin \sqrt{x} dx$
- (b) $\int \tan^2 x \sec^2 x dx$
- (c) $\int \sqrt{x} \ln x dx$

Problem 4 (extra). Compute the following integrals:

- (a) $\int \sin^2 x \cos^3 x dx$
- (b) $\int \sec^4 x dx$