

Due Tuesday, September 5th at the beginning of class. Show all work and write solution on separate paper, treating this as a cover sheet.

Use integration by parts to find the following:

- $\int_4^9 \frac{\ln y}{\sqrt{y}} dy$

- $\int \frac{x}{e^{2x}} dx$

- $\int t^2 \sin(\pi t) dt.$

- $\int \cos(\sqrt{x}) dx$ (Make a substitution first.)

- $\int e^{-x} \cos(\pi x) dx$

- $\int (\ln x)^2 dx$

- $\int \arccos z dz$

- $\int \sin(\ln w) dw$ (Make a substitution first.)

- $\int_1^{\sqrt{3}} \arctan(1/x) dx$

- $\int x^3 \sqrt{1+x^2} dx$

- $\int \sec^3 \theta d\theta$

- Show that

$$\int (\ln x)^n dx = x(\ln x)^n - n \int (\ln x)^{n-1} dx.$$