

1. INTEGRATION BY PARTS

Solve the following problems. Use integration by parts, but always be on the lookout for when u -substitution would be easier.

Problem 1 :

$$\int \ln(x) \, dx$$

Problem 2 :

$$\int \frac{\ln(x)}{\sqrt{x}} \, dx$$

Problem 3 :

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

Problem 4 :

$$\int x^2 e^x \, dx$$

Problem 5 :

$$\int \frac{\ln(\sqrt{x})}{\sqrt{x}} \, dx$$

Problem 6 :

$$\int \cos(x) e^x \, dx$$

Problem 7 :

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

Problem 8 :

$$\int \frac{6x}{e^{3x}} \, dx$$

Problem 9 :

$$\int x^5 \ln(x) \, dx$$

Problem 10 :

$$\int \frac{x}{(x+5)^3} \, dx$$

Problem 11 :

$$\int 4x \cos(x^2 + 1) \, dx$$

Problem 12 :

$$\int x \sec^2(x^2 + 1) \, dx$$

Problem 13 :

$$\int x (e^{x^2} - e^x) \, dx$$

Problem 14 :

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

Problem 15 :

$$\int x \cos(e^{-1}) \, dx$$

Problem 16 :

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

Solutions will be posted during spring break.