

Section 8-1: Integration by parts

Formula for integration by parts :

$$\int uv' dx = uv - \int u'v dx.$$

$$\int_a^b uv' dx = [uv]_a^b - \int_a^b u'v dx.$$

Remark:

Exercise 1. Evaluate the integrals

1. $\int_0^3 x e^x dx.$

2. $\int (x^2 + 3x - 4) e^{2x} dx.$

3. $\int x^3 e^{x^2} dx.$

Remark:

Exercise 2. Evaluate the integrals

1. $\int x \sin 3x dx.$

2. $\int_0^{\pi/6} (x^2 - 1) \cos(2x) dx.$

Remark:

Exercise 3. Evaluate the integrals

1. $\int_1^4 x^5 \ln x dx.$

2. $\int (x + 1) \ln(\sqrt{x}) dx.$

3. $\int \ln(x) dx$

4. $\int (\ln(x))^2 dx$

Remark:

Exercise 4. Evaluate the integrals

1. $\int_0^1 \text{Arctan } x dx.$

2. $\int \text{Arcsin } 2x dx.$

3. $\int x \text{Arctan } x.$

Remark:

Exercise 5. Evaluate the integrals

1. $\int_0^1 e^{2x} \sin 3x dx.$

2. $\int \sin(\ln(x)) dx.$