



Series of Tutorial 3 - Math2

Exercise 1

Calculate the following integrals:

1. $\int \frac{e^x}{e^x + 1} dx$

2. $\int \cos^3(x) dx$

3. $\int \frac{\cos^5(x)}{\sin(x)} dx$ (SUPP)

4. $\int \sqrt{1-x^2} dx$ (SUPP)

5. $\int x^3 e^x dx$

6. $\int (x^2 - x) \cos x dx$

7. $\int \arctan(x) dx$ (SUPP)

8. $\int \frac{x^3 - x + 2}{x^3 - 2x^2 + 2x} dx$

9. $\int \frac{2x + 3}{x^2 - 5x + 6} dx$

10. $\int \frac{x^3 + 3x^2 + 5x + 7}{x^2 + 2} dx$ (SUPP)

Exercise 2

Evaluate the following integrals:

1. $\int_0^{\frac{\pi}{2}} \frac{\cos x}{6 - 5 \sin x + \sin^2 x} dx$

2. $\int_1^2 x \ln x dx$

3. $\int_0^{\pi} \frac{1}{3 + \cos x} dx$

4. $\int_0^1 \frac{1}{x^3 + 1} dx$. (SUPP)

Exercise 3

Calculate the following integral:

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

Exercise 4(SUPP)

1. Calculate the following integral:

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

2. Hence deduce:

$$\int \frac{e^x}{e^x - 3e^{-x} + 2} dx$$