

TD 02

Exercise 01: Evaluate the following integrals:

1. $\int \frac{x}{\sqrt{25-x^2}} dx$; 2. $\int \frac{x+1}{x^2} dx$; 3. $\int x \cos(x^2) dx$
4. $f_4(x) = \int \frac{1}{x \ln(x)} dx$; 5. $\int \sin(2x) dx$; 6. $f_6(x) = \int \sqrt{2x+3} dx$.

Exercise 02: Calculate the following integrals:

1. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cos(x) dx$; 2. $\int_1^4 (x^2 + 2x - 1) dx$; 3. $\int_{e^1}^{e^2} \frac{1}{x \ln(x)} dx$.

Exercise 03: Evaluate the following integrals by using integration by part:

1. $\int x^2 \ln(x) dx$; 2. $\int x \exp(-x) dx$; 3. $\int \left(\frac{\ln(x)}{x}\right)^2 dx$
4. $\int x \sin^2(x) dx$; 5. $\int e^x \cos(x) dx$; 6. $\int \sin(\ln(x)) dx$.

Exercise 04: Evaluate the following integrals by substitution (change of variable)

1. $\int \frac{dx}{\sqrt{2-5x}}$; 2. $\int \frac{x}{\sqrt{4x+5}} dx$; 3. $\int x \sqrt{x-1} dx$
4. $\int \frac{x}{\sqrt{1-x^2}} dx$; 5. $\int \frac{e^x}{2+e^x} dx$; 6. $\int \frac{(\ln(x))^2}{x} dx$.

Exercise 05: Evaluate the following integrals of rational functions:

1. $\int \frac{x^2}{1-x^2} dx$; 2. $\int \frac{dx}{(1+x)(1+x^2)}$;
3. $\int \frac{dx}{x^2+2x-3}$; 4. $\int \frac{4-2x}{(x^2+1)(x-1)^2} dx$.