University of Biskra
Mathematics Department
Module: Analysis 2

First year license
2023/2024

Homework

Compute the following indefinite integrals

Trigonometric functions

1. $\int \sin^n(x) \cos^m(x) dx$,
2. $\int \sin(nx) \cos(mx) dx$,
3. $\int \sin(nx) \sin(mx) dx$,
4. $\int \cos(nx) \cos(mx) dx$,
5. $\int \cos^2(x) dx$,
6. $\int \sin^4(x) dx$,

with $n,\ m \in \mathbb{N}$

Irrational functions

1. $\int \frac{x^2+1}{\sqrt{-\frac{1}{2}x^2+2x-5}} dx$,
2. $\int \frac{1}{(x-1)\sqrt{x^2-2}} dx$.

Euler's substitutions

1. $\int \sqrt{a^2-x^2} dx$,
2. $\int \frac{dx}{\sqrt{-x^2-x+2}} dx$,
3. $\int \frac{1}{(x+1)\sqrt{-x^2+x+1}} dx$

Other:

1. $\int \frac{x \arctan(x)}{(1+x^2)^2} dx$
2. $\int \frac{1}{x \ln^\alpha(x)} dx$ with $\alpha \in \mathbb{R}$
3. $\int \frac{1}{\sqrt{x+a}+\sqrt{x+b}} dx$