

BSM 6-Line and Multiple integrals and Laplace Transforms

Programme	B.Sc
Subject	Mathematics
Semester	V
University	Kuvempu University
Session	8

Double integration

Evaluation of double integrals under given limits

Recap of previous class

- Definition of line integral and basic properties
- Definition of double integrals and basic properties

Objectives:

1. Evaluation of double integrals under given limits
2. Examples on double integrals under given limits

Session outcomes

- To able to understand the double integration
- To able to understand properties of double integration
- To able to understand problems

Prerequisites

- Standard formulae of integration

Problems:

1) Evaluate $\int_0^2 \int_1^3 xy dx dy$

2) Evaluate $\int_0^1 \int_0^2 2y - 3x^2 y^2 dx dy$

3) Evaluate $\int_0^3 \int_0^2 [4x + y]^3 dx dy$

4) Evaluate $\int_0^3 \int_0^2 xye^{x^2} dx dy$

Session Summary:

- To solve double integration, which is useful in finding certain areas.
- The knowledge is a must before tackling double integrals

MCQ :

1) $\int_0^1 \int_0^{\sqrt{1+x^2}} \frac{dx dy}{1+x^2+y^2}$ is equal to

A. $\frac{1}{4} \log(1 + \sqrt{2})$

B. $\frac{1}{4} \log(\sqrt{2} - 1)$

C. $\frac{\pi}{4} \log(1 + \sqrt{2})$

D. None of the above

ANS : C

MCQ :

2. $\int_0^a \int_0^{\sqrt{a^2-x^2}} (a^2 - x^2 - y^2) dy dx$ is equal to

A) $\frac{1}{8} \pi a^4$

B) $\frac{1}{4} \pi a^3$

C) $\frac{1}{2} \pi a^4$

D) $\frac{1}{6} \pi a^3$

Ans : A

MCQ :

3. Solution of $\int_0^3 \int_1^2 xy(1+x+y)dxdy$ is

A. $\frac{4}{123}$

B. $\frac{123}{8}$

A. $\frac{123}{4}$

B. None of these

Ans : C

MCQ:

4. Solution of $\int \int xy dx dy$ over positive quadrant of $x+y < 1$ is

A. $\frac{1}{8}$

B. $\frac{1}{16}$

C. $\frac{1}{24}$

D. $\frac{1}{32}$

Ans: C

References:

- Manjunath, B. V. and Nandeeshkumar(2018). A textbook of B.Sc Mathematics. College book house, Bangalore.
- Ranganath G. K (2012). A textbook of B.Sc Mathematics (Sixth). S. Chand, New Delhi.