BSM 6 - Line and Multiple integrals and Laplace Transforms

Programme	B.Sc
Subject	Mathematics
Semester	V
University	Kuvempu University
Session	9

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 $\int_0^{\frac{\pi}{2}} \int_0^{acos\theta} \frac{ar}{\sqrt{a^2-r^2}} drd\theta$
2) Evaluate $\int_0^{\frac{\pi}{2}} \int_0^{\infty} \frac{rdrd\theta}{(r^2+a^2)^2}$
3) Evaluate $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \int_0^{2cos\theta} r^2 drd\theta$
4) Evaluate $\int_0^{\pi} \int_0^{a(1+cos\theta)} r^2 sin\theta cos\theta$
5) Evaluate $\int_0^{\frac{\pi}{4}} \int_0^{sec\theta tan\theta} r^3 cos^2\theta drd\theta$

Session Summary:

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

MCQ :

1)The solution of $\int_1^3 \int_0^1 xy^2 dydx$

A) $\frac{1}{3}$

B) $\frac{3}{2}$

C) $\frac{4}{3}$

D) 0

ANS : C

MCQ :

2) The solution of $\int_0^5 \int_0^{x^2} x(x^2+y^2)dxdy$

$A. 5^6 \frac{29}{24}$

$B. 5^2 \frac{23}{24}$

C. 24

D. None of the above

Ans : A

MCQ :

3. Solution of $\int \int x^2 y^2 dy \ over\ the\ region\ x^2 + y^2 \leq 1\ is$

A. $\frac{\pi}{32}$

B. $\frac{\pi}{24}$

C. $\frac{\pi}{16}$

D. $\frac{\pi}{8}$

Ans : B

MCQ:

4. Solution of $\int\int x^2y^3dxdy$ over the circle $x^2 + y^2 = a^2$ is

$A.0$
B. 1
C. 2
D. None of these

Ans: A

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.