FUNDAMENTALS OF LINEAR ALGEBRA, CALCULUS & DIFFERENTIAL EQUATIONS (MAT211BT)

Multiple Integrals

TUTORIAL SHEET-1

1.
2.
3. =
4. Find the area bounded between the parabola and .
5. Show that the area of one loop of the lemniscates $r^2 = a^2 \cos 2\theta$ is $a^2/2$.
6. Find the area of one petal of the rose
7. Find the area of the circle $r = a \sin\theta$ outside the cardioid
8. Find the volume of the paraboloid of revolution $x^2 + y^2 = 4z$ cut off by the plane $z = 4$.
9. Find the volume of the region bounded by the paraboloid and the cylinder .
10. Find the volume of the portion of the sphere lying inside the cylinder .
11. Find the volume cut off the sphere by the cone .
12. Change the order of the integration in the integrals:

    a)

    b)

    c)

    d)

FUNDAMENTALS OF LINEAR ALGEBRA, CALCULUS & DIFFERENTIAL EQUATIONS (MAT211BT)

Multiple Integrals

TUTORIAL SHEET-2

1. Given , the region of integration is _____ and the integral value is _____.
2. The value of the integral is_____
3. The value of the integral _____.
4. Area of the plane region R in the Cartesian coordinates using double integral is _____.
5. Prove that 8. Evaluate
6. Evaluate
7. Evaluate .
8. Evaluate .
9. Evaluate
10. Evaluate .
11. Evaluate.

FUNDAMENTALS OF LINEAR ALGEBRA, CALCULUS & DIFFERENTIAL EQUATIONS (MAT211BT)

Multiple Integrals

TUTORIAL SHEET- 3

1. Change the order of integration
2. Change the variables in the polar coordinates in the integrals
3. Area of the plane region R in the Polar coordinates using double integral is _____
4. Volume of the region R in Cartesian coordinates in the form of triple integral is ...
5. The value of the integral is_____
6. Evaluate, Where A is the domain bounded by the x-axis , ordinate x = 2a
7. and the curve .
8. dy dx over the area bounded by the ellipse .

9. Change the order of integration and hence evaluate the following integral.
10. a. b. c. d.
11. Change to polar coordinates and evaluate the following integral.
12. a. b. c.
12. Using the triple integrals, find the volume of the sphere $x+ y^2 + z^2 = a^2$.
13. Find the volume of the ellipsoid .
14. Change the order of the integration in the integrals:
    a)
    b)
    c)
    d)