# Practice sheet # 4

1. Evaluate the iterated integrals:

(a) (b) (c) (d).

2. (a) Find the area of the region inside the circle r = 4sin and outside the circle r = 2.

(b), where R is the region in the first quadrant bounded by

y = 0 , y = x and x2 + y2 = 4 .

3. Use polar coordinates to evaluate the double integral.

4. (a) Find the volume of the solid that is bounded by the cylinder y = x2 and by the

planes y + z = 4 and z =0.

(b) Use cylindrical / spherical coordinates to evaluate the integral

(i)  (ii) .

5. Evaluated the iterated integral by converting to polar coordinates:

(a)  (b) 

(c) .

6. (a) Evaluate  by applying transformation T :

where  and integrating over an appropriate region in *uv*–plane.

(b) Evaluate  , where R is the region enclosed by the lines

 , ,  &  , using the transformation .

**Double Integral**

Exercise 15.1- 1-16,19-22

Exercise- 15.2- 1-22

Exercise-15.3- 1-12,23-30

# Triple Integral

Exercise-15.5- 1-12, 15-18, 21,22,

Exercise-15.7- 1-16

Book: Elementary Calculus- Howard Anton (7th Edition)

# Practice sheet # 5

1. Evaluate the line integral  from (1,0,0) to (-1,0,0) along the helix C that is

represented by the parametric equation x = cost, y = sin t , z = t .

2. Evaluate  if

1. C consists of line segments from (2,1) to (4,1) and from (4,1) to (4,5).
2. C is the line segment from (2,1) and (4,5).
3. Parametric equation for C are x = 3t – 1, y = 3t2 – 2t ; .

3. Show that (a)  is independent of the path joining

the points (1,2) and (3,4) (b) hence evaluate the integral.

4. Show that  is a conservative field and

find a potential function for it.

5. Let  represents a force

field . Find the work done by F in moving a particle around an ellipse C in the

xy – plane , whose equation is given by  .

6. Let  represents a force field.

Determine if is independent of path if it is, find a potential function  .

7. Let 

(a) Show that F is a Conservative Vector field on the entire xy – plane ,

(b) find  by first integrating  ,

(c) find  by first integrating  .

8. Use the potential function obtained in example (7) to evaluate the integral

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