**Multiple Integration**

Integration of multi-variable is called multiple Integration. Repeated definite and indefinite of form for two variables are called iterated integral. Repeated definite and indefinite of form for three variables

**Evaluation of double integral**

, is first integrated with respect to *y*  treating *x* as constant between the limits and and then the result is integrated with respect to *x*  between the limits *a* and *b .*

**Example1**

Sol.

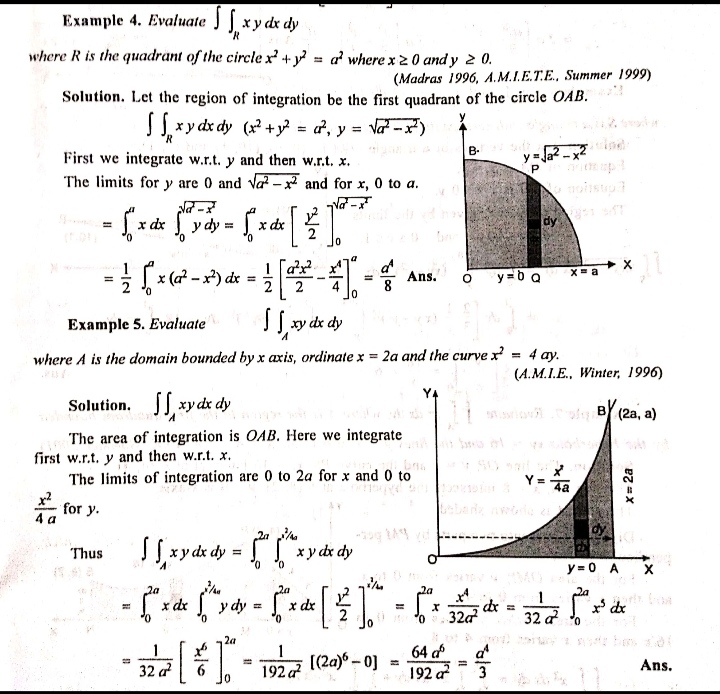
Evaluate:

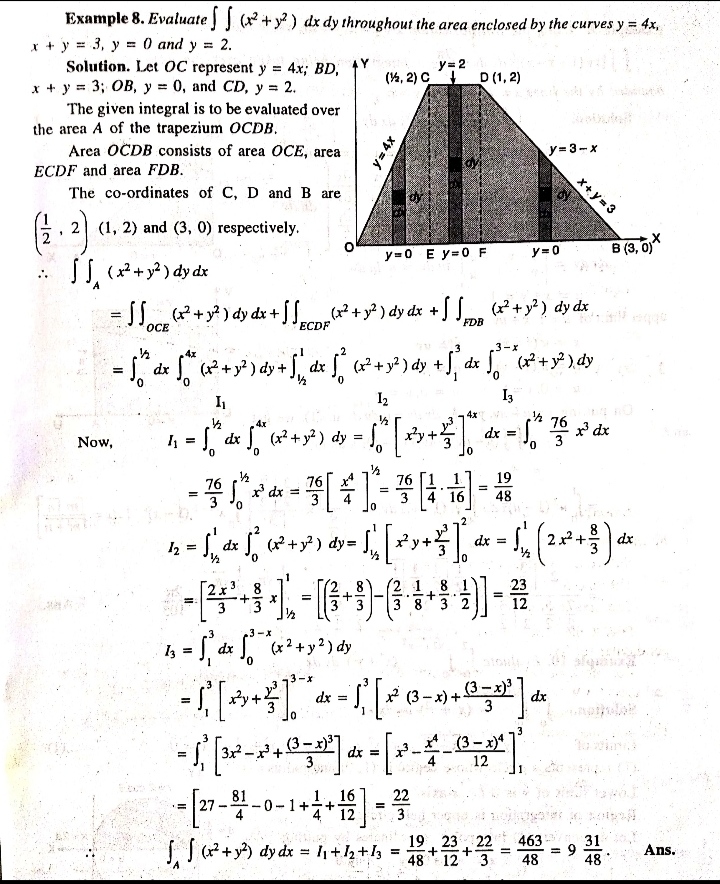
Soln.

dx

++

+2



  
**Triple Integrals**

Evaluate:

**Soln.**

Evaluate:

Soln.

dydx

dx

**Change of variable**

Sometime double , triple integral easily be evaluated by changing the dependent variables by suitable transformations .

Let , , the double integral

where *J*= Jacobian =

similarly for triple integral can be written as

and and so on.

xample: Evaluate by transformations.

Soln. put

Lower limit of x is 0 and upper limit of

Lower limit of and upper limit of

Evaluate by transformations

Soln. put

Lower limit of z is 0 and upper limit of

Lower limit of and upper limit of

Lower limit of and upper limit of