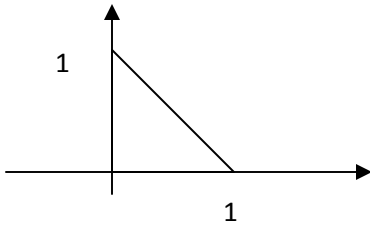


## 12.5 Applications of Double Integrals

### Density of a region $D$

#### Example 1

Charge is distributed over a triangular region  $D$  shown. If the charge density at a point  $(x, y)$  is given by  $\sigma(x, y) = xy$ , find the total charge on the plate.



## Center of Mass

### Example 2

Find the center of mass of a parabolic region  $y = x^2$  bounded above by  $y = 4$  if the density function is  $\rho(x, y) = x^2y$ .

## Moment of Inertia

### Example 4

Find the moment of inertia of a disk centered at the origin with radius  $a$  and constant density  $\rho(x, y) = \rho$ .