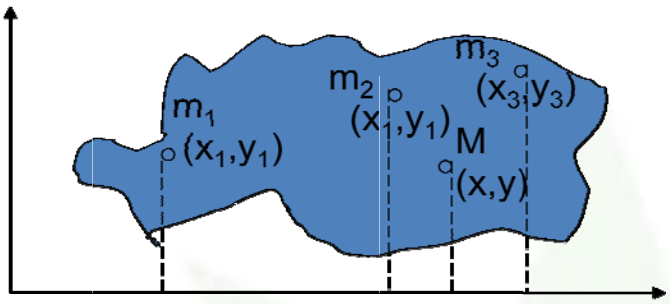
Center of Mass

M = mass of the lamina If we take the moment of all the point masses about the X axis we get m_1y_1, m_2y_2, m_3y_3…. and moment about Y axis m_1x_1, m_2x_2, m_3x_3 …..



∴ Sum total of moments of all the point masses about X-axis=$m_1y_1+m_2y_2+m_3y_3+….=\Sigma my$

Sum total of moments of all the point masses about Y-axis =$m_1x_1+m_2x_2+m_3x_3+…=\Sigma mx$

Let us now find a point C on lamina such that if we imagine a point mass M equal to the mass of the lamina at C then the moment of that point mass about X and Y axis would be same as the sum total of moments of all the point masses about X and Y axis respectively the C is known as center of mass.

Moment of point mass M at C about X axis = M.Y = Σmy

Moment of point mass M at C about Y axis = M.X = Σmx

m.CN = Moment of point mass about the axis passing through the center of mass.

Σm.CN = Sum of total moments of all the point masses about an axis passing through the center of mass , according to the definition of center of mass it should be ZERO.

Σm.CN = 0