The LNM Institute of Information Technology, Jaipur
Academic Session, 2018-19, First Semester

Classical Mechanics : Center of Mass

Assignment-3

Assignment- 2 : Please search some good problems of Newton's Laws of motion (Body moving in curved path) and solve them by plane polar coordinate

1. Find the center of mass of the 2-dimensional region bounded by the x-axis, y-axis and the curve $y = 4 - x^2$ in the first quadrant, if the surface density is uniform. [Ans: (x,y)=(3/4, 8/5)]

2. Find the center of mass of the triangle with vertices (x,y) = (0,0), (-4,2) and (0,6), if the area has a uniform surface density. [Ans: (x,y) =(-3/4, 8/3]

3. Find the center of mass of a hollow hemisphere with uniform surface density, with radius S, total mass M and the center of the base lying at the origin of coordinates. [Ans: z=S/2]

4. A uniform plate has the shape of the region bounded by the parabola $y = ax^2$ and the line y=H in the x-y plane . Find the center of mass in terms of H only [Ans: 3/5 H **J**]