

Instructions: Five points total. Show all work for credit.

1. (5 pts.) Find the mass m and center of mass (\bar{x}, \bar{y}) of the lamina R that is bounded by $y = 1 - x^2$ and the x -axis, when the density function is given by $\rho(x, y) = 10y \text{ mg/cm}^2$

(a) (2 pts.) Compute the mass m of the lamina, including units in your answer.

- (b) (1 pt) You could do a complicated integral to conclude that the moment about the y -axis, $M_y = 0$. Instead, give a reason that $M_y = 0$ **without using Calculus at all** by thinking. If you are at a loss initially, think about the density function $\rho(x, y)$, the lamina, and the formula for M_y .

Answer: $M_y = 0$ because

(c) (2 pts.) Now compute the center of mass (\bar{x}, \bar{y}) , showing all work for credit. What are the units?