

MATH 265 Section E1 Practice Test Number 3

Problem 1 (25 points)

Calculate Mass and center of mass coordinates of the plane region given by the triangle with vertices $(0, 0)$, $(1, 1)$ and $(2, 0)$ and density δ in *Mass/Area* given by $\delta = y$.

Problem 2 (25 points)

Calculate the surface area for the surface

$$z = 3 + 2x^2 + 2y^2,$$

above the annulus between the circle of radius 1 and the circle of radius 2.

Problem 3 (25 points) Calculate the mass of the solid region enclosed by the cylinder $y = 1 - x^2$, the plane $z = 2 - y$, the plane $y = 0$, and the plane $z = 0$ and with density $\delta = y$.

Problem 4 (25 points)

Consider the portion of the ball of radius 1 in the first octant. Assume the density is proportional to the distance from the origin. Find the (x, y, z) coordinates of the center of mass.