

Total from volume density

Problem: A solid rectangular region of dimensions L by W by H has non-uniform composition so that the volume mass density is proportional to the square of the distance from one corner, reaching a maximum value δ_0 at the far corner. Compute the total mass.

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Problem: Compute the volume of the solid region in the first octant bounded by the coordinate planes ($x = 0$, $y = 0$, $z = 0$) and by the surface $z = 4 - x^2 - y^2$.

Total from volume density

Problem: A solid cylinder of height H and radius R has non-uniform composition so that the volume mass density is proportional to the distance from the central axis, reaching a maximum value δ_0 at the surface. Compute the total mass.

Total from volume density

Problem: A solid sphere of radius R has non-uniform composition so that the volume mass density is proportional to the square of the distance from the center, reaching a maximum value δ_0 at the surface. Compute the total mass.