

Lecture 8



Triple

Integrals

Mini Exam

Thursday

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1) Triple Integrals

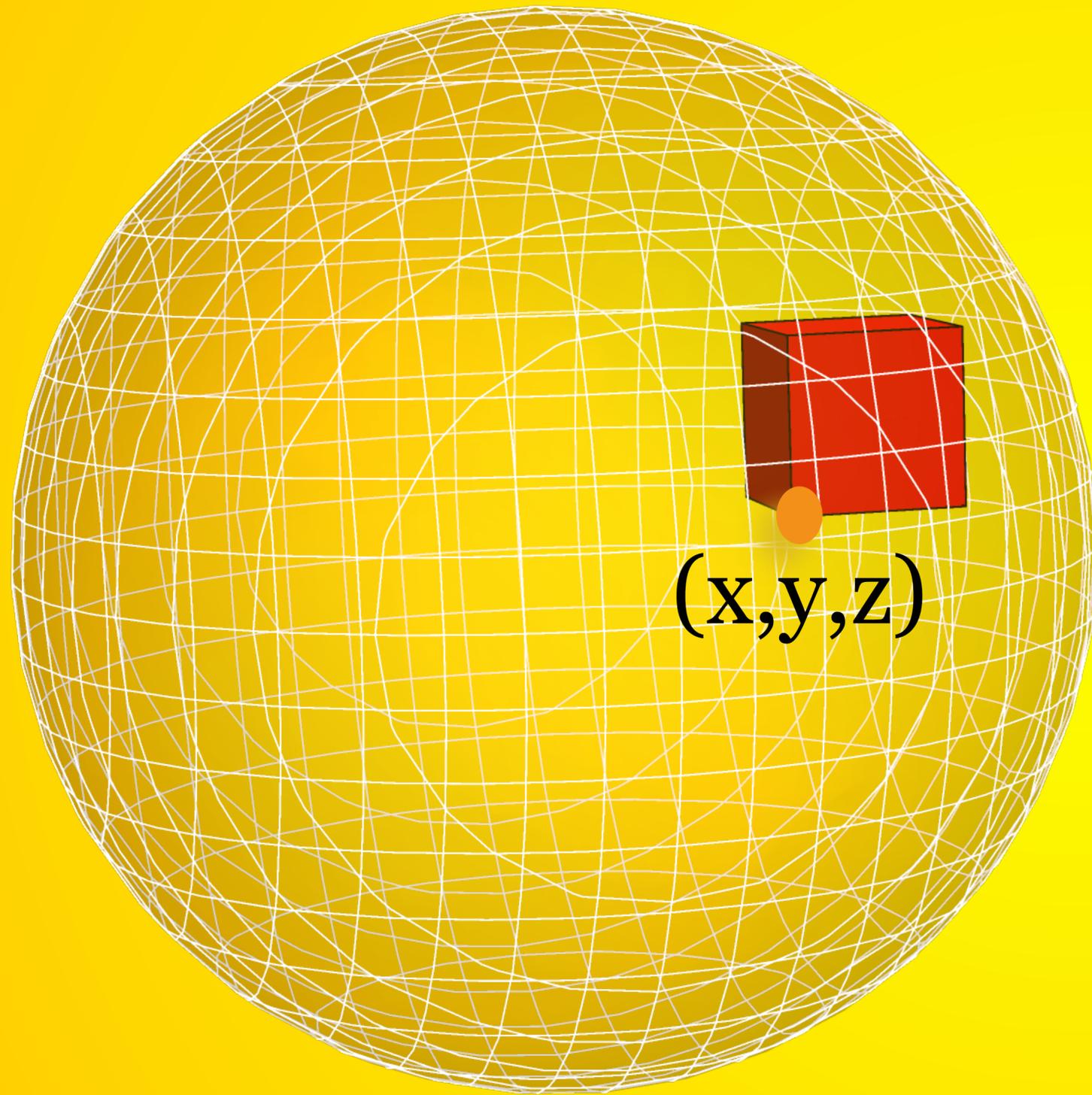
2) Burger and Fries

3) The sphere

4) Archimedes

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Triple integrals



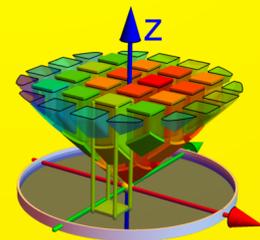
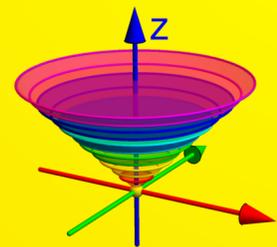
$$dV = dx dy dz$$

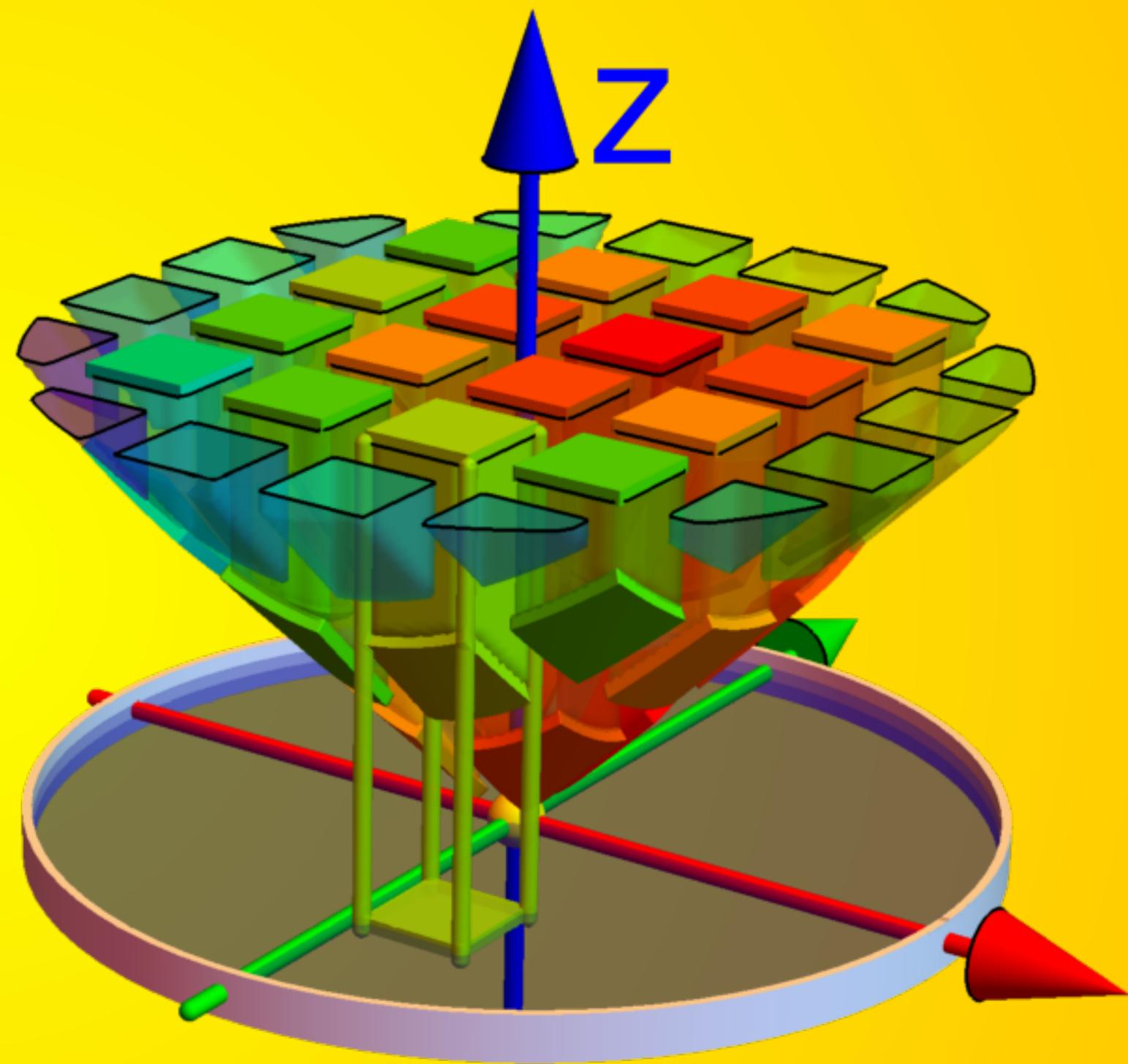
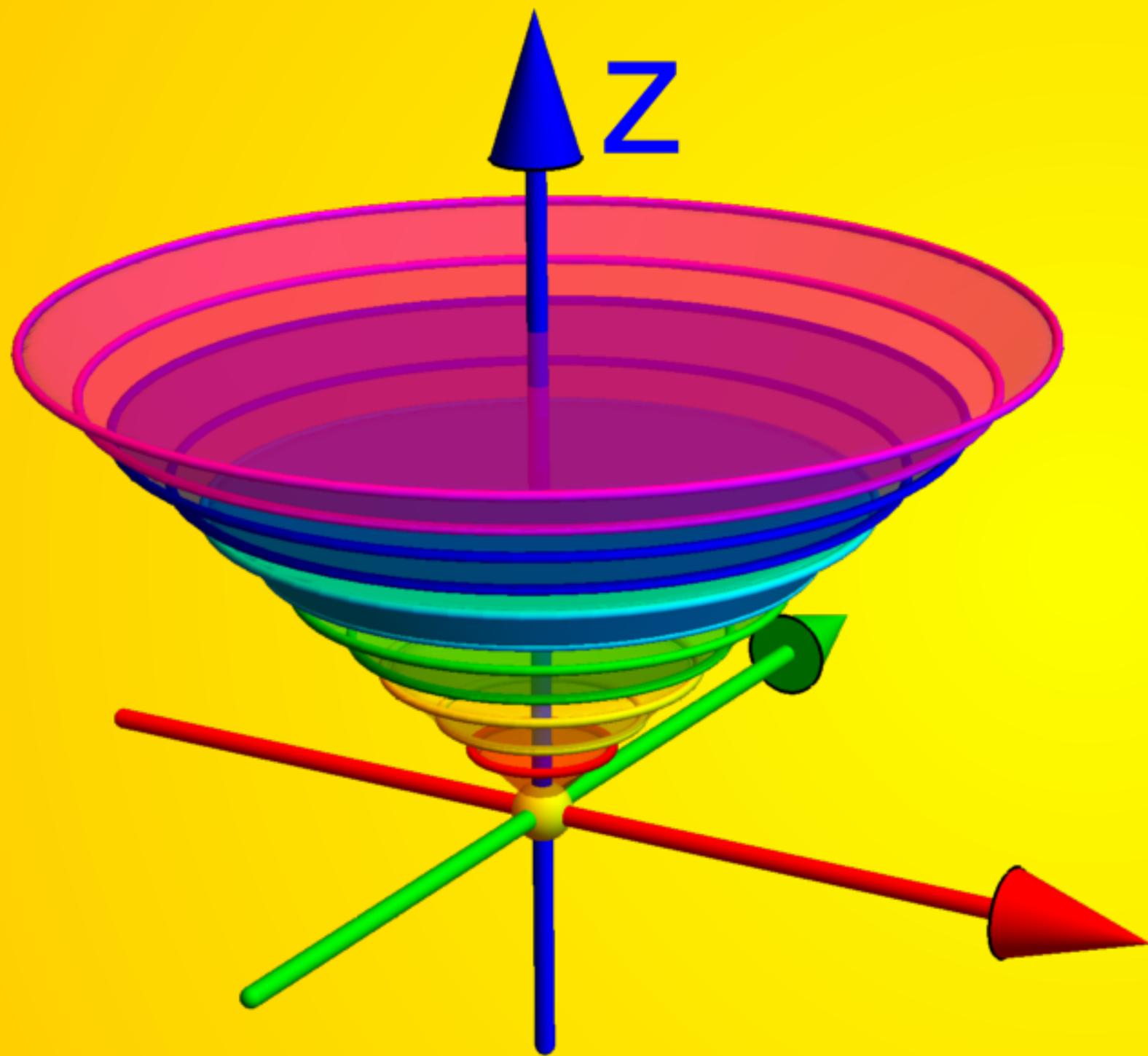
$f(x, y, z)$
density

$$\iiint_U f(x, y, z) dV$$

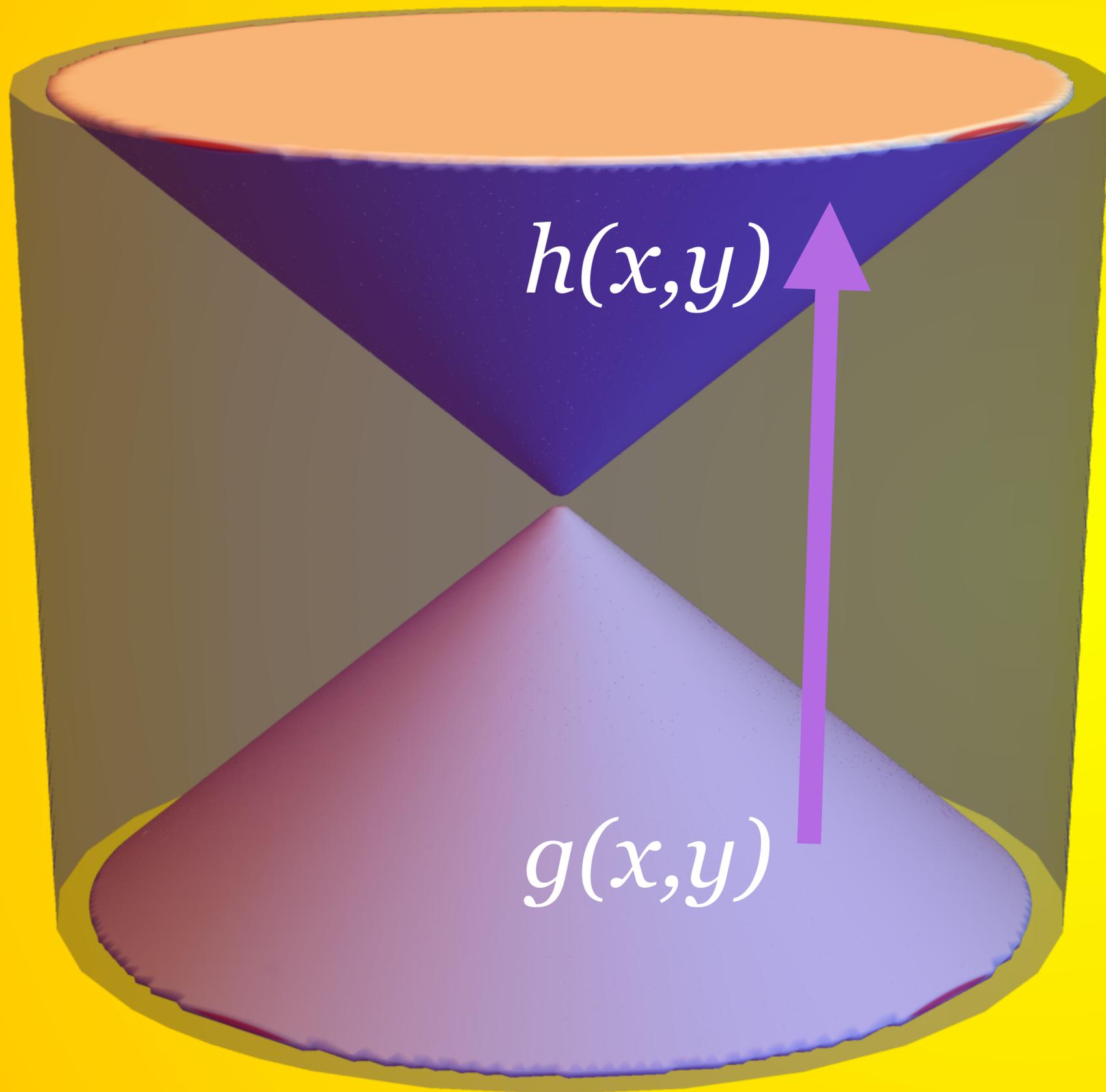
total Mass

Burger and Fries





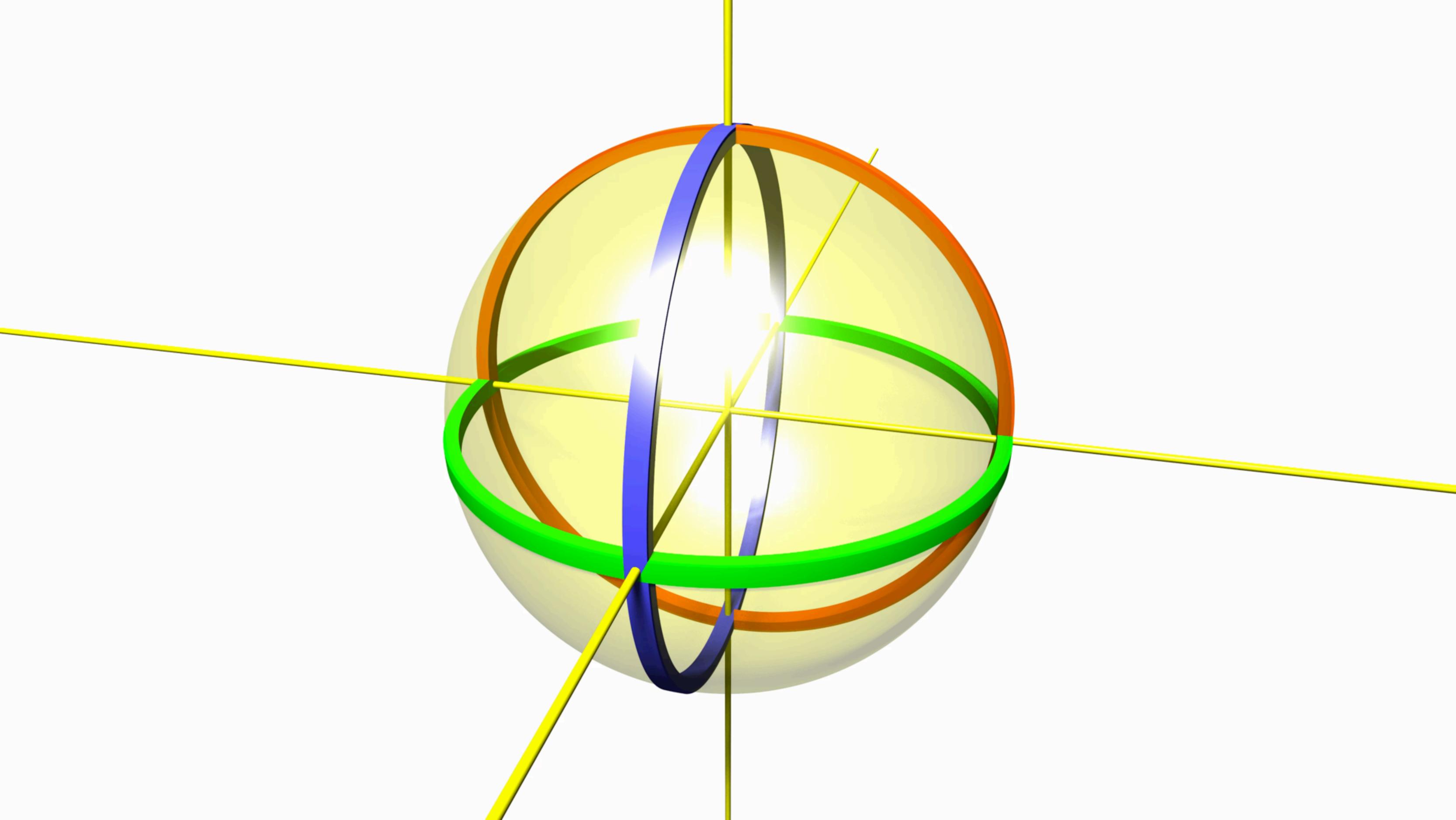
Typical Setup



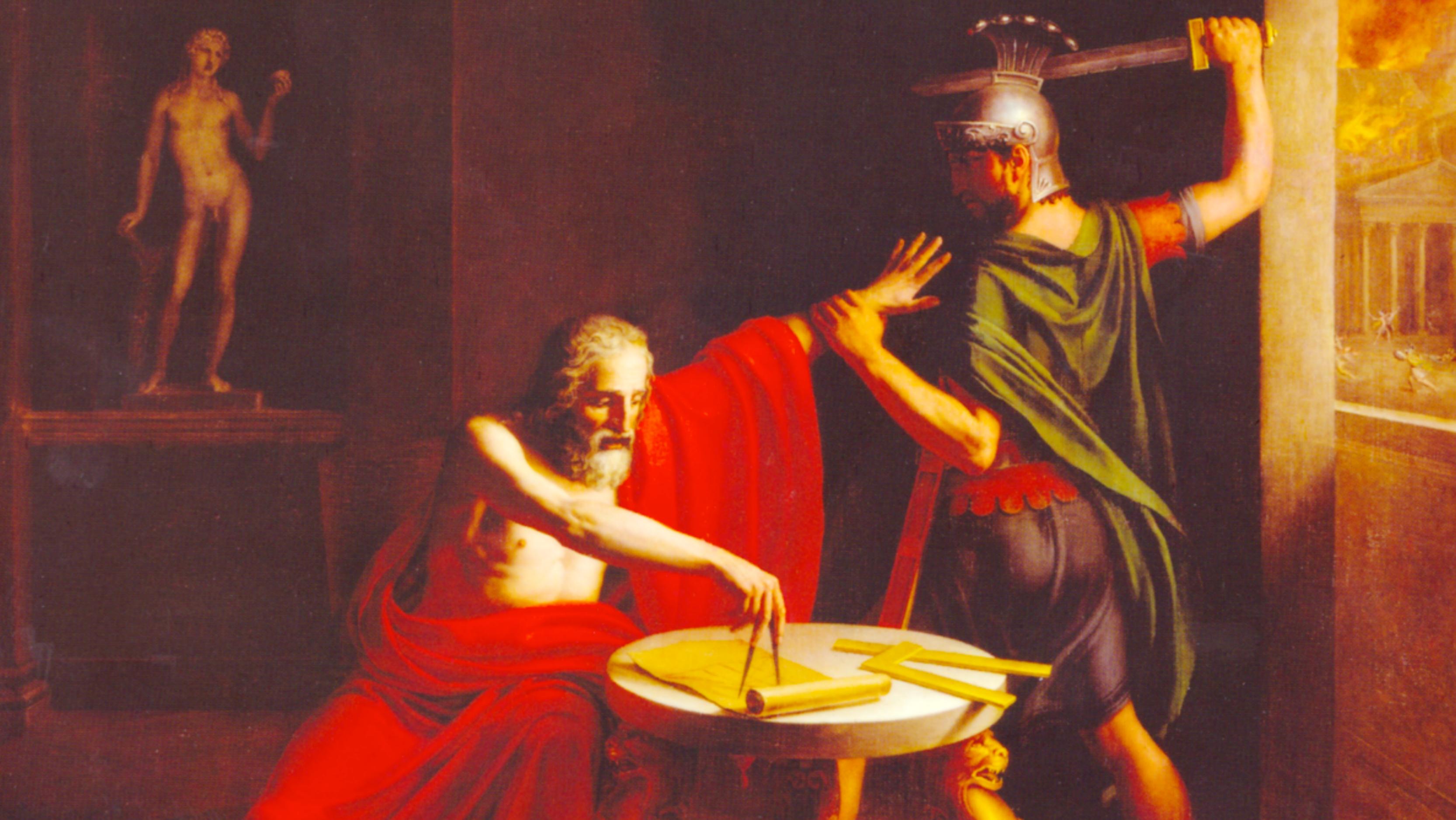
$$\iint_R \int_{g(x,y)}^{h(x,y)} f(x,y,z) dz dA$$

The Sphere



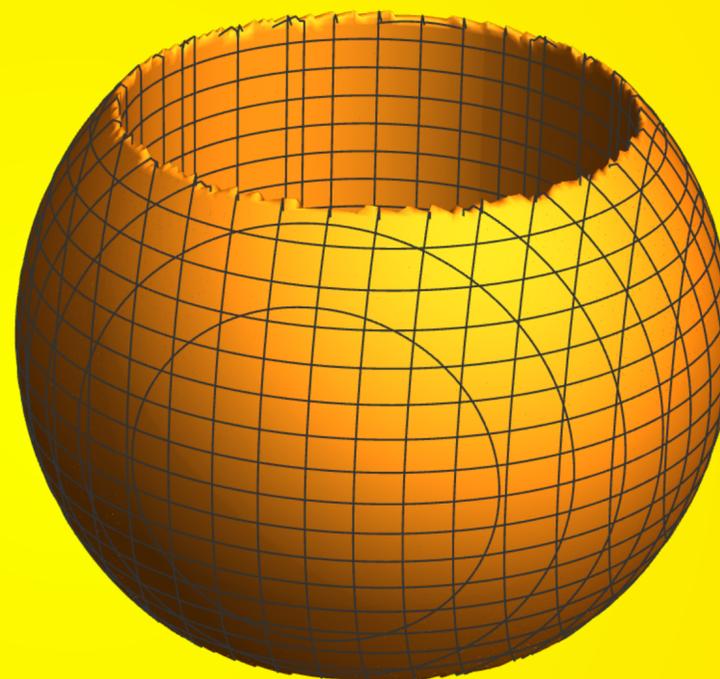
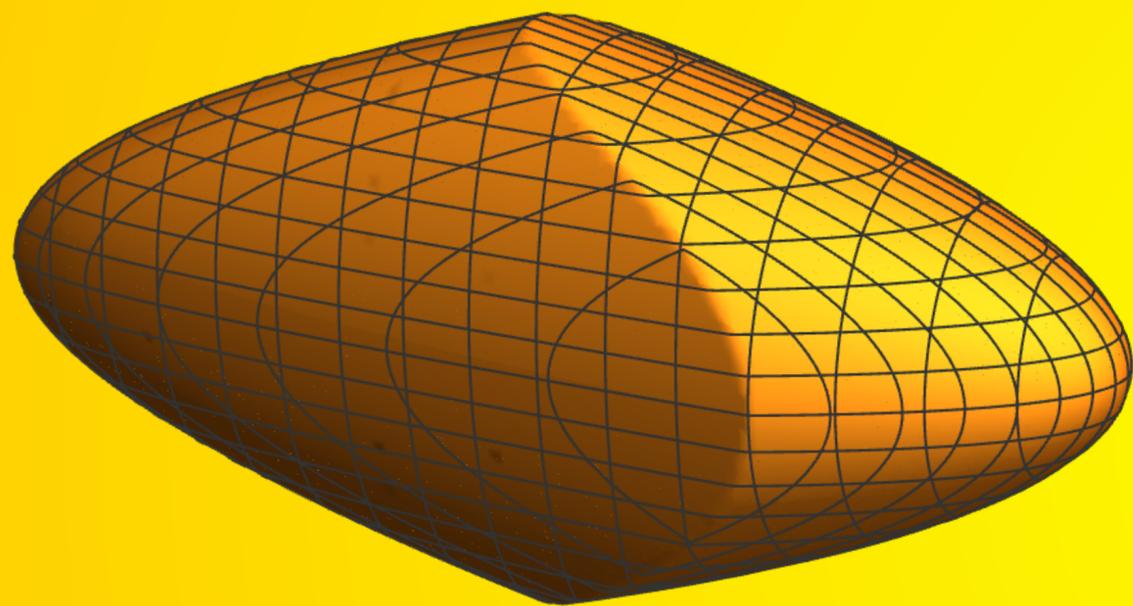






Worksheet

Problems 5-7



`RegionPlot3D[y > 3 x^2 + z^2 && y < 8 - x^2 - z^2, {x, -4, 4}, {y, 0, 8}, {z, -4, 4}]`

`RegionPlot3D[x^2 + y^2 + z^2 < 2 && x^2 + y^2 > 1, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]`

`RegionPlot3D[z^2 > 4 (x^2 + y^2) && x^2 + y^2 < 4 && 0 < z < 9 && y > 0, {x, -6,6}, {y, -6, 6}, {z, 0, 9}]`

Homework

due Friday

Good luck in the
mini exam!

THE END