Math 13, Winter 2018

Homework set 3, due Wed Jan 24

Please show your work. No credit is given for solutions without justification.

(1) Find the volume of the solid bounded by the surfaces $z = y^2$ and $z = 2 - x^2$.

(2) Find the center of mass of the solid region inside the sphere $x^2 + y^2 + z^2 = 1$ with $x \geq 0$, $y \geq 0$, $z \geq 0$.
Hint. Because of symmetry, the x, y, z coordinates of the center of mass are equal. You only have to compute one of them.

(3) Find the total mass of the solid region bounded by the cone $z = \sqrt{x^2 + y^2}$ and the plane $z = 2$. The mass density of this solid is $\delta(x, y, z) = e^{-z}$.