Calc 3 - HW

Note Title 10/31/2015

(1) Find the volume of the solid bounded by $z = 0$ and $z = 1 - x^2 - y^2$

(2) Find $\iint_R \cos(x^2+y^2)\, dA$, where R is region above x-axis inside $x^2+y^2 = 4$

(3) Find volume of a sphere in $\mathbb{R}^3$ with radius R

(4) Find center of mass of a lamina with density function $\rho(x,y) = xy^2$ over $[0,2] \times [-1,1]$

(5) Find center of mass of lamina with density $\rho(x,y) = x$ bounded by $x = y^2$, $y = x - 2$

(6) Find $\iiint_R xyz^2\,dV$, $R = [0,1]\times[-1,1]\times[1,2]$

(7) Find $\iiint_R z\,dV$, where R is bounded by $x=0, y=0, z=0$, $x+y+z=1$

(8) The moments of inertia are $I_x = \iint_R y^2 \rho(x,y)\,dA$ and $I_y = \iint_R x^2 \rho(x,y)\,dA$, respect.
Suppose we have two laminas with density functions
$\rho_1(x,y) = 4 - x^2 - y^2$ and $\rho_2(x,y) = x^2 + y^2$. Both laminas are shaped like discs
of radius 2. Show that they have the same mass and center of gravity but

different moments of inertia. Explain.