Worksheet #19; date: 03/22/2018
MATH 53 Multivariable Calculus

1. *(Stewart 15.2.29)* Find the volume of the solid enclosed by the cylinders $z = x^2$, $y = x^2$ and the planes $z = 0$ and $y = 4$.

2. *(Stewart 15.2.51)* Evaluate the integral by reversing the order of integration.
$$\int_0^1 \int_{3y}^3 e^{x^2} \, dx \, dy$$

3. *(Stewart 15.3.21)* Use polar coordinates to find the volume of the solid below the plane $2x + y + z = 4$ and above this disk $x^2 + y^2 \leq 1$.

4. *(Stewart 15.3.23)* Use polar coordinates to find the volume of a sphere of radius a.

5. *(Stewart 15.6.7)* Evaluate the iterated integral.
$$\int_0^\pi \int_0^1 \int_0^{\sqrt{1-z^2}} z \sin x \, dy \, dz \, dx$$

6. *(Stewart 15.6.22)* Use a triple integral to find the volume of the solid enclosed by the cylinder $x^2 + y^2 = 4$ and the planes $y = -1$ and $y + z = 4$.

7. *(Stewart 15.6.41)* Find the mass and center of mass of the solid E with the given density function ρ, where E is the cube given by $0 \leq x \leq a$, $0 \leq y \leq a$, $0 \leq z \leq a$ and $\rho(x, y, z) = x^2 + y^2 + z^2$.