Assignment 5

Coverage: 15.7 in Text.

Exercises: 15.7 no 10, 12, 14, 16, 18, 20, 26, 32, 38, 42, 54, 62, 66.

Submit 15.7 no. 12, 16, 66 by Feb 23.

Supplementary Problems

1. Let
$$F(t) = \iiint_{\Omega} f(x^2 + y^2 + z^2)\, dV \ ,$$
where Ω is the ball of radius t centered at the origin and f is continuous.

Assignment 5

Please submit the following questions by **23 Feb 2021, 23:00**.

§15.7: Q12, **Q16: duplicated**, Q66

Q12

Let D be the region bounded below by the cone $z = \sqrt{x^2 + y^2}$ and above by the paraboloid $z = 2 - x^2 - y^2$. Set up the triple integrals on cylindrical coordinates that gives the volume of D using the following orders of integration.

(a) $dz\, dr\, d\theta$

(b) $dr\, dz\, d\theta$

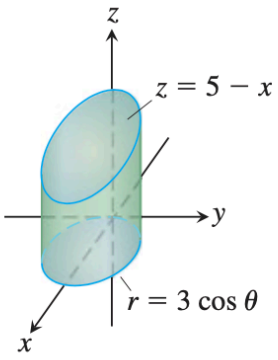
(c) $d\theta\, dz\, dr$

§15.7 Q16 (Duplicated)

One point will be given if you got it correct.

In the following exercise, set up the iterated integral for evaluating $\iiint_D f(r, \theta, z)\, dz\, r\, dr\, d\theta$ over the given region D.

D is the right circular cylinder whose base is the circle $r = 3\cos\theta$ and whose top lies in the plane $z = 5 - x$.



Q66

Find the average value of the function $f(\rho, \phi, \theta) = \rho\cos\phi$ over the solid upper ball $\rho \leq 1$, $0 \leq \phi \leq \pi/2$.