

Assignment 5

Coverage: 15.6, 15.7 in Text.

Exercises: 15.6. no 9, 13, 19, 23. 15.7. no. 14, 15, 19, 26, 34, 37, 42, 45, 55, 59, 76.

Submit 15.7. no. 14, 19, 37, 42, 59, by Feb 21, 2023.

Supplementary Problems

1. Let Ω be the bullet-shaped solid bounded above by the upper side of $x^2 + y^2 + (z - 2)^2 = 1$, below by the xy -plane, and the cylinder $x^2 + y^2 = 1$ on the side. Express the triple integral of a function f over Ω in two ways: $d\rho d\varphi d\theta$ and $dz dr d\theta$.
2. Let D be a region in the plane which is symmetric with respect to the origin, that is, $(x, y) \in D$ if and only if $(-x, -y) \in D$. Show that

$$\iint_D f(x, y) dA(x, y) = 0 ,$$

when f is odd, that is, $f(-x, -y) = -f(x, y)$ in D . Suggestion: Convert to polar coordinates.