

Written HW11 – MATH 3503 Fall 2021

Due by 29 September for timely completion credit

Use a transformation to polar coordinates to answer the following questions.

1. Calculate $\iint_R xy dA$ where R is the region inside the disk $x^2 + y^2 \leq 4$ but outside of the disk $x^2 + y^2 \leq 1$.
2. Find the volume of the region inside the hemisphere $z = \sqrt{9 - x^2 - y^2}$ but outside of the cylinder $x^2 + y^2 \leq 4$.
3. Present a plot the cardioid $r = 1 + \cos(\theta)$ and find its area.