

Math 3298 Worksheet 19: Surface area and surface integrals

Group members (1 to 4): _____

- (1) Find the average value of z^2 on the portion S of the plane $x + y + z = 6$ inside the cylinder $x^2 + y^2 = 4$. Compute the average as the ratio of the scalar surface integral $\int \int_S z^2 \, dS$ to the surface area $\int \int_S dS$.

- (2) Find the surface area of the portion of the sphere $x^2 + y^2 + z^2 = 4z$ which is above the paraboloid $z = x^2 + y^2$.