

Math 3298 Worksheet 31: two problems in 3D

Group members (2 to 4): _____

- (1) Find the mass of the ball $x^2 + y^2 + z^2 \leq 9$ if its density is $(x^2 + y^2 + z^2)^{n/2}$, where n is an integer. For which values of n is the mass defined? For which value of n is the mass minimized?

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