

Math 3298 Worksheet 24

Group members (1 to 3): _____

- (1) Suppose we make a box out of material that costs ten cents a square foot, but the bottom and top are reinforced by using a double layer. What is the largest size box we can make if we want to use only \$1 dollar per box?

- (2) Use Stokes' Theorem to compute $\int \int_S \nabla \times \vec{F} \cdot d\vec{S}$ where $\vec{F} = (2y \cos(z), e^x \sin(z), xe^y)$ and S is the upper hemisphere of $x^2 + y^2 + z^2 = 9$ with upward-pointing normal (i.e the z -component is positive).

- (3) Find the maximum value of the integral $\oint (y^3 - y)dx - 2x^3dy$ over all simple closed curves. (Use Green's theorem.)