

Problem 1

Let R be the upper half of the unit circle, evaluate $\iint_R x^2 + y^2 \, dA$.

Problem 2

Change the following integral from rectangular to polar coordinates and evaluate it:

$$\int_0^1 \int_{-\sqrt{1-y^2}}^0 \ln(x^2 + y^2 + 1) \, dx dy$$

Problem 3

Let R be the doughnut shaped region $1 \leq x^2 + y^2 \leq 4$. Find $\iint_R e^{\sqrt{x^2+y^2}} dA$.

