

MATH 20E PRACTICE MIDTERM II Fall 2011

Please justify all your steps!

- Find the area of the triangle with corners $(1,2,2)$, $(3,2,1)$ and $(2,0,2)$.
 - Find the equation of the plane which contains the triangle in (a).
- Calculate the integral $\int \int_D \cos(x^2 + y^2) dx dy$, where D is the region given by $x \geq 0$, $y \geq 0$ and $x^2 + y^2 \leq (\pi/2)^2$.
- Evaluate the line integral $\int_C \mathbf{F} \cdot ds$ for the vector field $\mathbf{F}(x, y, z) = (y, 2x, y)$ and the path C given by $c(t) = (t, t^2, t^3)$ for $0 \leq t \leq 1$.
- Let S be the part of the paraboloid $z = x^2 + y^2$ which is inside the cylinder $x^2 + y^2 = 4$.
 - Calculate its surface area
 - Calculate the integral $\int \int_S (x^2 + y^2) dS$.