Math 20E

September 3, 2013

Question 1 Given a simple domain D with C^1 boundary ∂D, the area of D is given by

A. $A(D) = \displaystyle\iint_D dx\,dy$

B. $A(D) = -\displaystyle\int_{\partial D} y\,dx$

C. $A(D) = \dfrac{1}{2}\displaystyle\int_{\partial D} x\,dy - y\,dx$

D. A and **C**

*E. A**, **B** and **C**

Question 2 Suppose $\mathbf{F}$ is a C^1 vector field on the unit sphere S in $\mathbb{R}^3$. Then, $\displaystyle\iint_S (\boldsymbol{\nabla}\times\mathbf{F})\cdot d\mathbf{S}$

A. is 0

B. is most easily computed by parametrizing S using spherical coordinates.

C. is most easily computed by applying Stokes' theorem and computing $\displaystyle\int_{\partial S} \mathbf{F}\cdot d\mathbf{s}$

D. cannot be computed using Stokes' theorem because the sphere S has no boundary curve ∂S

*__E.__ **A** and **C**: the line integral in **C** is 0 because the boundary curve ∂S is empty