

Quiz 11 - Math 53
December 4, 2008

Name _____

Consider the graph of the function $z = \sin(x)$, $0 \leq x \leq \pi/2$, in the xz -plane. Let S be the surface obtained by rotating this curve around the z -axis. S looks kind of like a cone that flares out at the wide end. Problems 1a and 1b refer to this surface.

1a)[3pts] Use Stokes' Theorem to compute the flux of $\nabla \times \mathbf{F}$ through S , where $\mathbf{F} = \langle -y, x, z \rangle$ and S is oriented "upward" (in the positive z direction).

1b)[3pts] Parameterize S . Don't forget to include the bounds on the parameters.

2)[3pts] Compute the flux of $\mathbf{G} = \langle x, y, z \rangle$ through the part of the cylinder $x^2 + y^2 = 1$ where $0 \leq z \leq 1$, oriented "outward" (away from the z -axis).