

Name and last 4 digits of student ID: \_\_\_\_\_

Express  $\iint_{\mathcal{S}} (\nabla \times \mathbf{F}) \cdot d\mathbf{S}$  as a line integral, where  $\mathbf{F}(x, y, z) = (\sin(xy), e^x, -yz)$  and  $\mathcal{S}$  is the surface given by  $x^2 + y^2 + 2z^2 = 25$  and  $z \leq 0$ .