Math 251 Quiz 33-April 21 Name_____
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1. Compute $\int\int_S \text{curl}\mathbf{F} \cdot d\mathbf{S}$ where $\mathbf{F} = x^2y^3\mathbf{i} + \mathbf{j} + z\mathbf{k}$. S is the hemisphere

   $x^2 + y^2 + z^2 = 16$ $z \geq 0$ $x^2 + y^2 \leq 4$ and the normal points in the $< 0, 0, 1 >$ direction.

2. Compute $\int\int \text{curl}\mathbf{F} \cdot d\mathbf{S}$ where $\mathbf{F} = x^2y^3\mathbf{i} + \mathbf{j} + z\mathbf{k}$. S is the sphere

   $x^2 + y^2 + z^2 = 16$ $z \leq 12$ and the normal points in the $< 0, 0, 1 >$ direction.

3. $\int \text{curl}\mathbf{F} \cdot d\mathbf{S}$ $\mathbf{F} = \langle y^2 z, x^2 z, z^3 \rangle$ S is the portion of the surface on the plane where $x + y + z = 16$ $x^2 + y^2 \leq 9$ and the normal points in the $< 0, 0, 1 >$ direction.