

Please sign your name: _____

Quiz 9 * Math 335 * Prof. Victor Matveev

1. (16pts) Verify the divergence theorem for vector field $\mathbf{F}=(0, 0, z)$ and the volume enclosed between the surface $z + x^2 + y^2 = 3$ and the $z = -1$ plane

$$\oiint_{\partial W} \mathbf{F} \cdot d\mathbf{S} = \iiint_W \nabla \cdot \mathbf{F} \, dV$$

2. (4pts) Without performing any calculations, indicate whether the flux of the following fields out of the surface of a sphere centered at the origin is positive, negative, or zero:

a) $\mathbf{F}=(0, 0, z^2)$ b) $\mathbf{F}=(0, 0, z)$ c) $\mathbf{F}=(x, y, z)$ c) $\mathbf{F}=(x, -3y, z)$