

You must show **all** work to receive full credit. All work is to be your own.

October 12

This is a closed books and notes test. Be organized. Total points: **40**

19:35-20:05

1. §10.6 Flux Integrals (3)  $\iint_S \mathbf{F} \cdot \mathbf{n} \, dA$ . Evaluate  $\iint_S x \, dydz - z \, dx dz + y \, dx dy$ . 20 points

Where  $S$  a portion of  $x^2 + y^2 + z^2 = 4$  in the first octant, oriented away from the origin. Describe the kind of surface. Show the details of your work.

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§10.7 Application of the Divergence Theorem: Surface Integrals  $\iint_S \mathbf{F} \cdot \mathbf{n} \, dA$

20 points

Evaluate the surface integral by the Divergence Theorem. Show the details.

$\mathbf{F} = [e^x, e^y, e^z]$ ,  $S$  the surface of the cube  $|x| \leq 1, |y| \leq 1, |z| \leq 1$