

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 the integral given below for the following data. Indicate the kind of surface. (Show the details of your work.) 20 points
- $\mathbf{F} = [x, y, z]$ ,  $S : \mathbf{r} = [u \cos v, u \sin v, u^2]$ ,  $0 \leq u \leq 4$ ,  $-\pi \leq v \leq \pi$

Evaluate the surface integral  $\iint_S \mathbf{F} \cdot \mathbf{n} \, dA$  by the Divergence Theorem. Show the details.

$\mathbf{F} = [x^3 - y^3, y^3 - z^3, z^3 - x^3]$ ,  $S$ , the surface of  $x^2 + y^2 + z^2 \leq 25$ ,  $z \geq 0$