## Calc 3, Assignment 28

1. Please state:

1. What is Green’s Theorem?
2. What is Gauss’ Theorem? What is its alternate name?
3. For what type of surface can you apply the Divergence theorem?
4. Find the following **surface areas**:
5. of the plane  above the rectangle  and 
6. of the cylinder  above the triangle bounded by , , and 
7. of the surface  above the circle 

# 3. Evaluate the following 3D volume integrals:

1. $∭\_{B}^{}xyz^{2}dV$, where B is the rectangular box given by $\{0\leq x\leq 1, -1\leq y\leq 2, 0\leq z\leq 3\}$
2. $∭\_{E}^{}zdV$, where E is the solid tetrahedron bounded by the planes *x = 0, y = 0, z = 0*, and *x + y + z = 1*
3. $∭\_{E}^{}\sqrt{x^{2}+z^{2}}dV$, where E is the region bounded by $y=x^{2}+z^{2}$ and $y=4$

# 4. Find the following integrals. You may use Maple to help you out.

1. Find the surface integral ****, where S is the surface **** such that x is between 0 and 2 and y is between 0 and 4.
2.  where S is the first-octant portion of the cylinder  between x = 0 and x = 4
3. The flux of the vector field $\vec{F}\left(x,y,z\right)=<x,y,z>$, where S is the portion of the surface $z=10-2x-2y$ between the coordinate planes.
4. The flux of the vector field  through the surface given by potion of the paraboloid  that lies above the xy-plane. Note that this surface is *not* closed.
5. Evaluate the flux integral where  and S is the closed surface given by  above the xy-plane together with the “lid” .
6. Evaluate the flux integral where  and S is 