Ad Math 370 Spring 2006

Homework 10 Due Monday, April 10

Chapter 12.2 # 1, 9, 15, 16 plus check Green's theorem by doing #12 in two ways - once using a double integral, and once by summing four line integrals, one for each edge of the square.

Chapter 12.3 # 1, 3, 5, 11, 15, 21

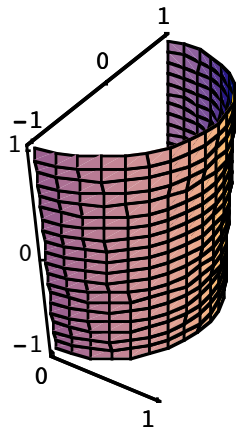
More hints for #21.. you'll need to use:

The formula (from class) for gradient of length function: $\nabla\|\mathbf{v}\| = \dfrac{\mathbf{v}}{\|\mathbf{v}\|}$

The chain rule: $\dfrac{d}{dt} f(\mathbf{v}(t)) = \nabla f \bullet \mathbf{v}'(t)$

Chapter 12.4 # A, B, C (below), 3, 5, 7, 11, 15

Problem A: Find a parameterization of the piece of cylinder shown below. Give both the formula and the range of values for u and v.



Problem B: Compute the normal vector and tangent plane to the surface $z = ye^x + y^3$ at the point (0, 2, 10)

Problem C: Consider the parameterized surface

$$x = (2 + \cos(v))\cos(u)$$
$$y = (2 + \cos(v))\sin(u)$$
$$z = \sin(v)$$

for $u, v \in [0,2\pi]$.

What does this surface look like?

Compute the normal vector and tangent plane at $\left(\frac{4+\sqrt{2}}{2}, 0, \frac{\sqrt{2}}{2}\right)$