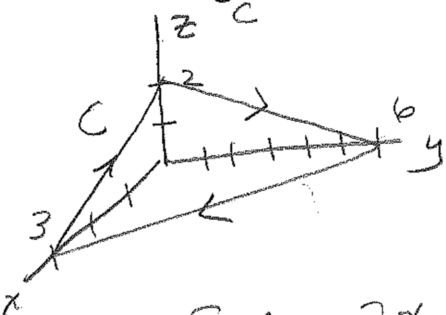
13.6

#16 Use Stokes' Theorem to evaluate the line integral in space $\oint_C (y\,dx + z\,dy + x\,dz)$

Where C is



Equation for surface S: $2x + y + 3z = 6$

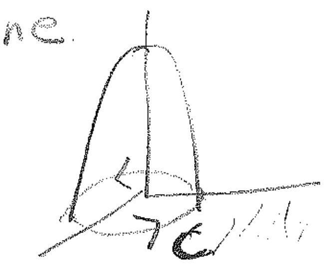
or $z = 2 - \frac{2}{3}x - \frac{1}{3}y$

$$\oint_C (y\,dx + z\,dy + x\,dz) = \oint_C \langle y, z, x\rangle \cdot \langle dx, dy, dz\rangle$$

$$\oint_C \vec{F} \cdot d\vec{R} = \iint_S \operatorname{curl} \vec{F} \cdot \vec{N}\,dS$$

$\vec{F} = \langle y, z, x\rangle$

\# 28 Use Stokes' Theorem to evaluate the line integral $\oint_C (x\,dx + y^2\,dy + xyz\,dz)$, where C is the intersection with the paraboloid $z = 4 - x^2 - y^2$ and the x-y plane, counterclockwise as C is traced viewed from above x-y plane.



$$\oint_C (x\,dx + y^2\,dy + xyz\,dz)$$

$$= \oint_C \langle x, y^2, xyz \rangle \cdot \langle dx, dy, dz \rangle$$

$$\oint_C \vec{F} \cdot d\vec{R} = \iint_S (\text{curl}\,\vec{F} \cdot \vec{N})\,dS$$

Hint: Use the surface in the x-y plane with $\vec{N} = \vec{k}$