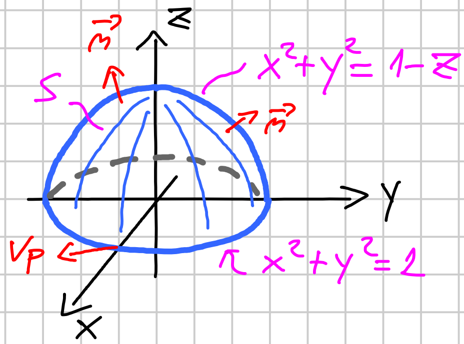
BY GIMUSI 08/06/15

$$\vec{F} = (\overset{A}{xy}, \overset{B}{z}, \overset{C}{\operatorname{arctg}(x+y)}) \qquad S: x^2+y^2+z=1,\ z \geq 0$$

NORMALE IN $P=(1,0,0)$: $V_P=(2,0,1)$



$$\operatorname{rot} \vec{F} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \partial x & \partial y & \partial z \\ A & B & C \end{vmatrix} =$$

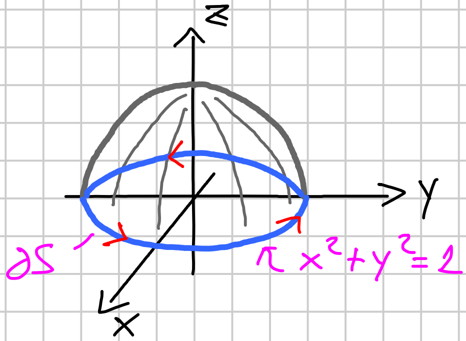
$$= (C_y - B_z)\hat{i} + (A_z - C_x)\hat{j} + (B_x - A_y)\hat{k} =$$

$$= \left(\frac{1}{1+(x+y)^2} - 1\right)\hat{i} + \left(\frac{-1}{1+(x+y)^2}\right)\hat{j} + (-x)\hat{k} = \left(\frac{-(x+y)^2}{1+(x+y)^2}, \frac{-1}{1+(x+y)^2}, -x\right)$$

FORMULA DI STOKES: $\displaystyle\int_S \operatorname{rot}\vec{F}\cdot\vec{n}\, d\sigma = \int_{\partial S} \vec{F}\cdot\vec{T}\, ds = \int_{\partial S} A\,dx + B\,dy + C\,dz$

$\partial S: \{(x,y,0) : x^2+y^2=1\}$

SENSO DI PERCORRENZA: ANTIORARIO



$$\int_{\partial S} A\,dx + \underbrace{B\,dy}_{=0} + \underbrace{C\,dz}_{=0} = \int_{\partial S} xy\, dx$$

PARAMETRIZZAZIONE DI ∂S: $(\cos t, \sin t, 0)$ $\quad 0 \leq t \leq 2\pi$

$$\int_{\partial S} xy\,dx = \int_0^{2\pi} \cos t \sin t\,(-\sin t)\,dt = \int_0^{2\pi} \sin^2 t\, d\sin t =$$

$$= \frac{1}{3}\left[\sin^3 t\right]_0^{2\pi} = 0$$