$$= -8\cdot\int_0^1 \frac{(2x^2-4x+2)\cdot(x-\frac{1}{2})-(x-1)\cdot(1-4x^2+4x-1)}{\sqrt{1-4\cdot(x-\frac{1}{2})^2}}\,dx =$$

$$= -8\cdot\int_0^1 \frac{2x^3-x^2-4x^2+2x+2x-1+4x^3-4x^2-4x^2+4x}{\sqrt{1-4\cdot(x-\frac{1}{2})^2}}\,dx =$$

$$= -8\cdot\int_0^1 \frac{6x^3-13x^2+8x-1}{\sqrt{1-4\cdot(x-\frac{1}{2})^2}}\,dx = \ldots = \Pi$$

б) Наћи циркулацију дуж пресечних кривих (Можемо користити и Стокса!)

$$I = \oint_C P\,dx + Q\,dy + R\,dz = \iint_\Gamma \operatorname{rot}\vec{A}\cdot\vec{N}\cdot d\vec{S} =$$

$$\operatorname{rot}\vec{A} = \begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ 2y\cdot z & -y & z \end{vmatrix} = (0,-1,2)$$

$$\Gamma: x^2 + \frac{y^2}{2} + \frac{z^2}{4} = 1$$

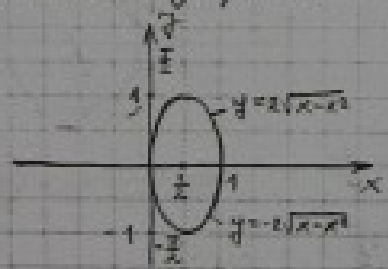
$$z = 2\cdot\sqrt{1-x^2-\frac{y^2}{2}} \qquad p = \frac{\partial z}{\partial x} = \frac{2x}{\sqrt{1+x^2-\frac{y^2}{2}}} \qquad q = \frac{\partial z}{\partial y} = \frac{-y}{\sqrt{1-x^2-\frac{y^2}{2}}}$$

$$I = \iint_D (0,-1,2)\cdot(-p,-q,1) = \iint_D (0,-1,2)\cdot\left(\frac{2x}{\sqrt{1-x^2-\frac{y^2}{2}}}, \frac{y}{\sqrt{1-x^2-\frac{y^2}{2}}}, 1\right) dx\,dy$$

$$= \iint_D \left(-\frac{y}{\sqrt{1-x^2-\frac{y^2}{2}}}+2\right) dx\,dy$$

D: пројекција пресека на xoy раван:

$$D: \frac{(x-\frac{1}{2})^2}{(\frac{1}{2})^2} + y^2 = 1$$



$$\frac{(x-\frac{1}{2})^2}{(\frac{1}{2})^2} = \rho^2\cos^2\varphi$$

$$\frac{x-\frac{1}{2}}{\frac{1}{2}} = \rho\cos\varphi$$

$$x-\frac{1}{2} = \frac{1}{2}\rho\cos\varphi$$

$$x = \frac{1}{2}\cdot(1+\rho\cos\varphi)$$

$$y = \rho\sin\varphi$$

$$\rho^2\cos^2\varphi + \rho^2\sin^2\varphi = 1$$

$$\rho^2 = 1 \Rightarrow \rho = 1$$

$$dx\,dy = \frac{1}{2}\rho\,d\rho\,d\varphi$$

$$I = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} d\varphi\cdot\int_0^1 \left(-\frac{\rho\sin\varphi}{\sqrt{1-\frac{1}{4}(1+\rho\cos\varphi)^2-\frac{\rho^2\sin^2\varphi}{2}}}+2\right)\cdot\frac{1}{2}\rho\,d\rho$$

$$= \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} d\varphi\cdot\int_0^1 \left(-\frac{\rho\sin\varphi}{\sqrt{1-\frac{1}{4}-\frac{1}{2}\rho\cos\varphi-\frac{1}{4}\rho^2\cos^2\varphi-\frac{1}{2}\rho^2\sin^2\varphi}}+2\right)\cdot\frac{1}{2}\rho\,d\rho =$$

У Декартовим координатама:

Граница: $0 \le x \le 1$ из $\Gamma \Rightarrow y = \pm 2\sqrt{x-x^2}$

$$-2\sqrt{x-x^2} \le y \le 2\sqrt{x-x^2}$$

$$I = \int_0^1 dx\cdot\int_{-2\sqrt{x-x^2}}^{2\sqrt{x-x^2}} \left(-\frac{y}{\sqrt{1-x^2-\frac{y^2}{2}}}+2\right) dy = \int_0^1 dx\cdot\left(2\sqrt{1-x^2-\frac{y^2}{2}}+2y\right)\Bigg|_{-2\sqrt{x-x^2}}^{2\sqrt{x-x^2}} = \ldots$$

ЗАДАТАК ОБОЈА ?