$$\Pi = \oint_{\Gamma} P\,dy\,dz + Q\,dx\,dz + R\,dx\,dy$$

- Пресекува на хоу рабон:

$$\frac{z}{c} = 3 - \frac{x^2}{a^2} - \frac{y^2}{b^2} \Rightarrow \boxed{z = 3c - x^2\frac{c}{a^2} - y^2\frac{c}{b^2}}$$

$$p = \frac{\partial z}{\partial x} = -\frac{2c}{a^2}\cdot x$$

$$q = \frac{\partial z}{\partial y} = -\frac{2c}{b^2}\,y$$

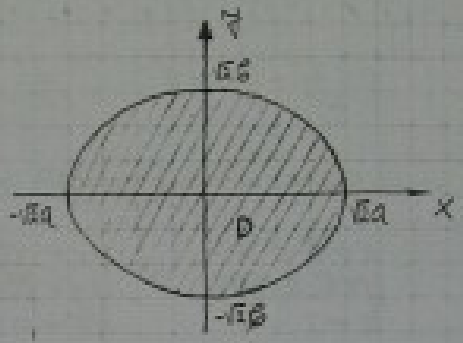
$$\Pi = \iint_D \left(y - c\cdot\left(3 - \frac{x^2}{a^2} - \frac{y^2}{b^2}\right),\ c\cdot\left(3 - \frac{x^2}{a^2} - \frac{y^2}{b^2}\right) - x,\ x\cdot y\right)\cdot\left(\frac{2c}{a^2}\cdot x,\ \frac{2c}{b^2}\,y,\ 1\right)dx\,dy$$

$$= \iint_D \left(\frac{2c}{a^2}\cdot xy - \frac{2c^2}{a^2}\cdot x\cdot\left(3 - \frac{x^2}{a^2} - \frac{y^2}{b^2}\right) + \frac{2c^2}{b^2}\cdot y\cdot\left(3 - \frac{x^2}{a^2} - \frac{y^2}{b^2}\right) - \frac{2c}{b^2}\,xy + x\cdot y\right)dx\,dy =$$

Смена:

- Пресекува пресечните криви на хоу рабон

$$\left.\begin{array}{l}\frac{x^2}{a^2} + \frac{y^2}{b^2} = 3 - \frac{z}{c}\\ z \geq c\end{array}\right\}\ \boxed{D: \frac{x^2}{a^2} + \frac{y^2}{b^2} = 2}$$ - елипса



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

$$\frac{x^2}{a^2} = \rho^2\cos^2\varphi \Rightarrow x = a\rho\cos\varphi$$

$$\frac{y^2}{b^2} = \rho^2\sin^2\varphi \Rightarrow y = b\rho\sin\varphi$$

$$J = \rho$$

↳ Малко нејасно! Заборави!

$$\frac{a^2\rho^2\cos^2\varphi}{a^2} + \frac{b^2\rho^2\sin^2\varphi}{b^2} = 2$$

$$\rho^2 = 2 \Rightarrow \rho = \sqrt{2}$$

$$0 \leq \rho \leq \sqrt{2}$$

$$0 \leq \varphi \leq 2\pi$$

$$\Pi = \int_0^{2\pi} d\varphi \cdot \int_0^{\sqrt{2}} \rho\cdot\left(\frac{2c}{a^2}\cdot a\cdot b\cdot\rho^2\cdot\sin\varphi\cos\varphi - \frac{2c^2}{a^2}\,a\cdot\rho\cdot\cos\varphi\cdot\left(3 - \frac{a^2\rho^2\cdot\cos^2\varphi}{a^2} - \frac{b^2\rho^2\sin^2\varphi}{b^2}\right)\right.$$

$$\left. - \frac{2c}{b^2}\cdot a\,b\cdot\rho^2\sin\varphi\cos\varphi + a\rho\cos\varphi - b\rho\sin\varphi\right)d\varphi =$$

$$= \int_0^{2\pi} d\varphi\cdot\int_0^{\sqrt{2}}\left(\frac{2ab}{a}\sin\varphi\cos\varphi\cdot\rho^3 - \frac{2c^2}{a}\cdot 3\cdot\cos\varphi\cdot\rho^2 + \frac{2c^2}{a}\cdot\cos\varphi\cdot\rho^4 - \frac{2ca}{b}\sin\varphi\cos\varphi\cdot\rho^3 +\right.$$

$$\left. + a\cos\varphi\,\rho - b\sin\varphi\,\rho\right)d\rho =$$

$$= \int_0^{2\pi} d\varphi\left(\frac{2ab}{a}\sin\varphi\cos\varphi\cdot\frac{\rho^4}{4} - \frac{6c^2}{a}\cos\varphi\,\frac{\rho^3}{3} + \frac{2c^2}{a}\cos\varphi\cdot\frac{\rho^5}{5} - \frac{2ca}{b}\sin\varphi\cos\varphi\,\frac{\rho^4}{4} +\right.$$

$$\left. + a\cos\varphi\,\frac{\rho^2}{2} - b\sin\varphi\,\frac{\rho^2}{2}\right)\Bigg|_0^{\sqrt{2}} = \dots = 0$$

$$\boxed{\Pi = 0}$$