$$P_1 = \iint_D \sqrt{1+p^2+q^2}\,dxdy = \iint_D \sqrt{\frac{x^2+y^2+x^2+y^2}{x^2+y^2}}\,dxdy = \iint_D \sqrt{2}\,dxdy =$$

$$= \sqrt{2}\iint_D dxdy = \sqrt{2}\cdot P(D)\ ,\quad P(D) = \pi r^2 = \pi\cdot 1 = \pi$$

$$\boxed{P_1 = \pi\sqrt{2}}$$

- Површина дела параболичног цилиндра $z=\sqrt{2x}$ унутар конуса $z=\sqrt{x^2+y^2}$ је:

$z=\sqrt{2x}\ ,\quad p=\frac{1}{\sqrt{2x}}\ ,\quad q=0$

Поларне координате:

$x=\rho\cos\varphi$

$y=\rho\sin\varphi$

$$P_2 = \iint_D \sqrt{1+p^2+q^2}\,dxdy = \iint_D \sqrt{1+\frac{1}{2x}}\,dxdy$$

$$= \iint_D \sqrt{1+\frac{1}{2\rho\cos\varphi}}\,\rho\,d\rho\,d\varphi = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} d\varphi\cdot\int_0^{2\cos\varphi}\sqrt{1+\frac{1}{2\rho\cos\varphi}}\,\rho\,d\rho = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} d\varphi\cdot I_1$$

$$= \int_0^{2\cos\varphi}\sqrt{1+\frac{1}{2\rho\cos\varphi}}\,\rho\,d\rho = \int_0^{2\cos\varphi}\sqrt{} \rightarrow$$ БОЉЕ У ДЕКАРТОВИМ КООРД.

$$\Rightarrow P_2 = \iint_{\substack{0\le x\le 2\\ -\sqrt{2x-x^2}\le y\le\sqrt{2x-x^2}}} \sqrt{1+\frac{1}{2x}}\,dxdy = \int_0^2 dx\cdot\sqrt{1+\frac{1}{2x}}\int_{-\sqrt{2x-x^2}}^{\sqrt{2x-x^2}} dy = 2\int_0^2 dx\,\sqrt{1+\frac{1}{2x}}\cdot\sqrt{2x-x^2} =$$

$$= 2\int_0^2\sqrt{1-x^2+\frac{3}{2}x}\,dx = 2\int_0^2\sqrt{\frac{25}{16}-\left(x-\frac{3}{4}\right)^2}\,dx = \left[\begin{array}{l} x-\frac{3}{4} = \frac{5}{4}\sin t\ ,\quad |t|<\frac{\pi}{2} \Rightarrow \\ dx = \frac{5}{4}\cos t\,dt\ ,\ -\arcsin\left(\frac{3}{5}\right)\le t\le\frac{\pi}{2} \Rightarrow 0\le x\le 2 \end{array}\right]$$

$$= 2\int_{-\arcsin\frac{3}{5}}^{\frac{\pi}{2}}\frac{5}{4}\cos t\cdot\frac{5}{4}\cos t\,dt = \frac{25}{8}\int_{-\arcsin\frac{3}{5}}^{\frac{\pi}{2}}\cos^2 t\,dt = \frac{25}{8}\int_{-\arcsin\frac{3}{5}}^{\frac{\pi}{2}}\frac{1+\cos 2t}{2}\,dt = \frac{25}{16}\left[t+\frac{\sin 2t}{2}\right]\Bigg|_{-\arcsin\frac{3}{5}}^{\frac{\pi}{2}}$$

$$= \frac{25}{16}\left[\frac{\pi}{2}+\arcsin\frac{3}{5}+\sin t\cos t\Big|_{-\arcsin\frac{3}{5}}^{\frac{\pi}{2}}\right] = \frac{25}{16}\left[\frac{\pi}{2}+\arcsin\frac{3}{5}-\sin\left(-\arcsin\frac{3}{5}\right)\sqrt{1-\sin^2\left(-\arcsin\frac{3}{5}\right)}\right] =$$

$$= \frac{25}{16}\left[\frac{\pi}{2}+\arcsin\frac{3}{5}-\frac{3}{5}\sqrt{1-\left(\frac{3}{5}\right)^2}\right] = \frac{25}{16}\left[\frac{\pi}{2}+\arcsin\frac{3}{5}+\frac{12}{25}\right]$$

$$\boxed{P = P_1+P_2 = \left(\frac{25}{32}+\sqrt{2}\right)\pi+\frac{25}{16}\arcsin\frac{3}{5}+\frac{3}{4}}$$