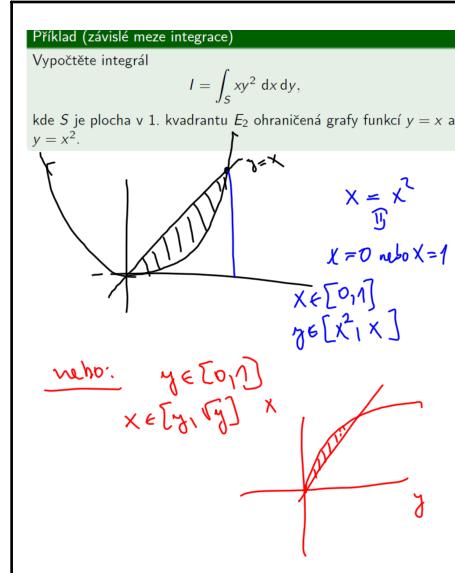
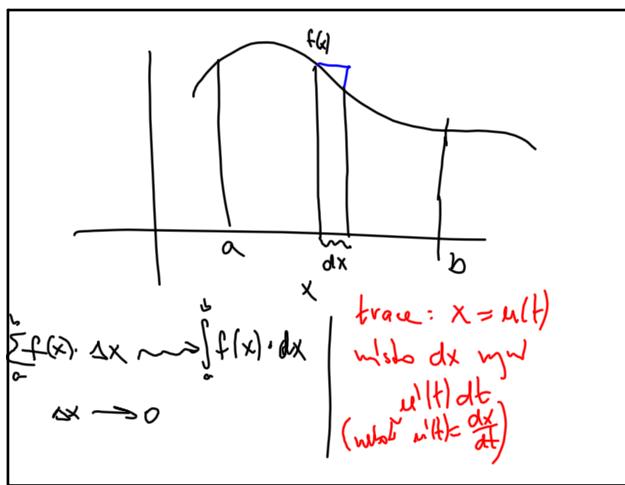


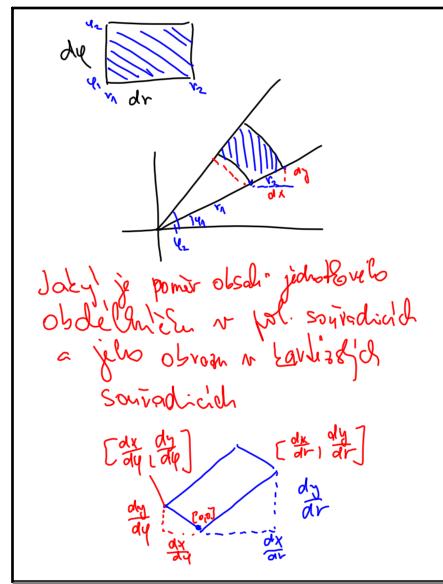
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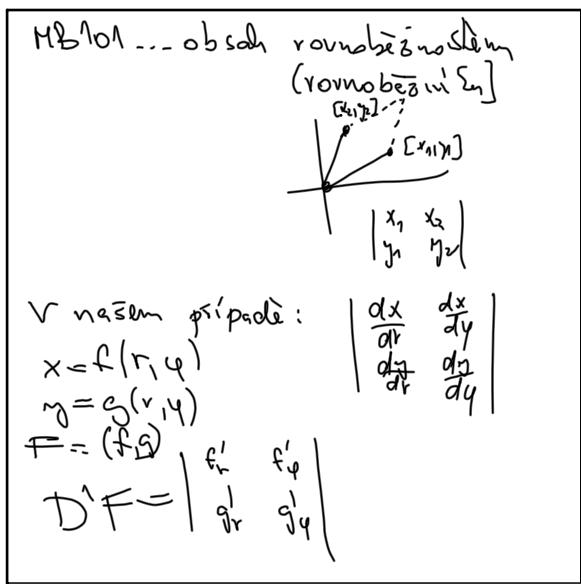
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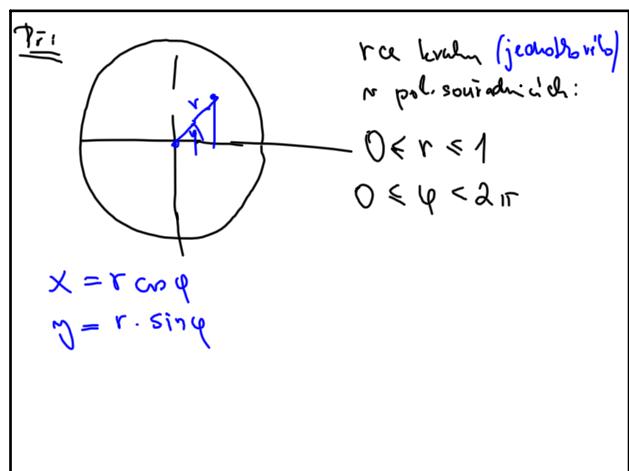
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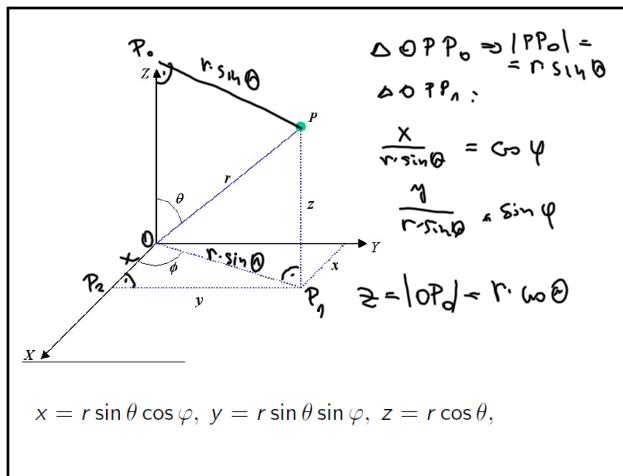
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10 31-12:41



10 31-12:46



10 31-12:59

Vypočítejte integral

$$I = \int_V \sqrt{x^2 + y^2 + z^2} dx dy dz,$$

kde množina V je vymezena plochou $x^2 + y^2 + z^2 = z$.

$x^2 + y^2 + (z - \frac{1}{2})^2 = \frac{1}{4}$
 Jde o sféru (povrch koule) se středem
 ve body $[0,0,\frac{1}{2}]$ a poloměrem $\frac{1}{2}$.

Podélší: $x^2 + y^2 \leq z$ mítak sestř. \sqrt{z}
 $r^2 \leq z \Leftrightarrow r \leq \sqrt{z} \Leftrightarrow$ sfér. sestř.
 \Rightarrow je tedy obvyklý integrál
 $\{ [r, \theta, \varphi] : r^2 \leq r \cos \theta, 0 \leq \varphi \leq 2\pi, 0 \leq \theta \leq \pi \}$
 $\theta \geq \frac{\pi}{2} \Rightarrow \cos \theta \leq 0 \Leftrightarrow$
 $r^2 \geq r \cos \theta \Leftrightarrow r \geq \cos \theta,$

$\Rightarrow \int_V \sqrt{x^2 + y^2 + z^2} dx dy dz = \int_0^\pi \int_0^{\pi/2} \int_0^{\sqrt{r^2 - r \cos \theta}} r \cdot r^2 \sin \theta dr d\theta d\varphi$
 $= \text{viz slajdy}$

10 31-12:59