

## Dvojni integral

### polarne koordinate

$$x = r \cos \varphi \quad 0 \leq \varphi \leq 2\pi$$

$$y = r \sin \varphi \quad r \geq 0$$

ploščina lika D

$$pl = \iint_D dx dy$$

Jacobijeva determinanta

$$J(r, \varphi) = r$$

volumen telesa s streho  $z = z(x, y)$  in projekcijo D

$$V = \iint_D f(x, y) dx dy$$

površina ploskve  $z = z(x, y)$  s projekcijo D

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

## Trojni integral

### cilindrične koordinate

$$x = r \cos \varphi \quad 0 \leq \varphi \leq 2\pi$$

$$y = r \sin \varphi \quad r \geq 0$$

$$z = z \quad -\infty \leq z \leq \infty$$

### sferične koordinate

$$x = r \cos \varphi \cos \vartheta \quad 0 \leq \varphi \leq 2\pi$$

$$y = r \sin \varphi \cos \vartheta \quad -\pi/2 \leq \vartheta \leq \pi/2$$

$$z = r \sin \vartheta \quad r \geq 0$$

Jacobijeva determinanta

$$J = r$$

Jacobijeva determinanta

$$J = r^2 \cos \vartheta$$

Težišče telesa z gostoto  $\rho$

$$x_T = \frac{\iiint_V x \rho dx dy dz}{\iiint_V \rho dx dy dz}, \quad y_T = \frac{\iiint_V y \rho dx dy dz}{\iiint_V \rho dx dy dz}, \quad z_T = \frac{\iiint_V z \rho dx dy dz}{\iiint_V \rho dx dy dz}$$

Vztrajnostni moment telesa z gostoto  $\rho$

$$J = \frac{1}{2} \omega^2 \iiint_V \rho r^2 dx dy dz$$

Vztrajnostni moment telesa z gostoto  $\rho$ , ki ga vrtimo okoli osi  $z$

$$J_z = \iiint_V \rho (x^2 + y^2) dx dy dz$$

*Jacobijeva determinanta*

$$J(u, v) = \begin{vmatrix} \frac{\partial x}{\partial u} & \frac{\partial y}{\partial u} \\ \frac{\partial x}{\partial v} & \frac{\partial y}{\partial v} \end{vmatrix}$$

