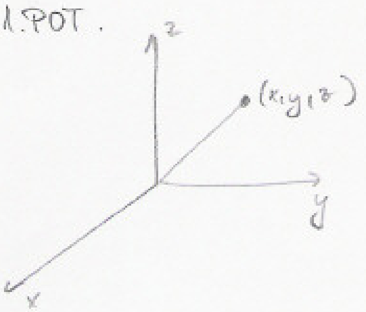
DN.

ČE OBSTAJA, DOLOČI SKALARNO POLJE, DA BO VELJALO

$$\operatorname{grad} u = (yz, xz, xy+1) = \vec{a}(x,y,z)$$

1.POT.



$$\vec{r}(t) = t(x,y,z) \qquad t\in[0,1]$$

$$\dot{\vec{r}}(t) = (x,y,z)$$

$$\int_{\gamma:(0,0,0)}^{(x,y,z)} \vec{a}\, d\vec{r} = \int_0^1 \vec{a}(tx,ty,tz)(x,y,z)\,dt$$

$$= \int_0^1 (ty\cdot tz,\ tx\,tz,\ tx\,ty+1)(x,y,z)\,dt = \int_0^1 [t^2xyz + t^2xyz + t^2xyz + z)\,dt$$

$$= \int_0^1 [3t^2xyz + z]\,dt = \cancel{3}xyz\frac{t^3}{\cancel{3}}\Big|_0^1 + zt\Big|_0^1 = xyz + z = z(xy+1)$$

PREIZKUS: $\operatorname{grad}(xyz+z) = (yz, xz, xy+1) \Rightarrow \vec{a}$ JE POTENCIALNO POLJE

2.POT:

$$u_x \overset{*}{=} yz$$
$$u_y \overset{**}{=} xz$$
$$u_z \overset{***}{=} xy+1$$

$$u_x \overset{*}{=} yz \Rightarrow u \overset{(1)}{=} xyz + \varphi(y,z)$$

$$\Rightarrow \left.\begin{aligned} u_y &= xz + \varphi_y(y,z) \\ u_y &\overset{**}{=} xz \end{aligned}\right\} \Rightarrow$$

$$\Rightarrow \varphi_y(y,z) = 0 \Rightarrow \varphi(y,z) = \psi(z)$$

$$\overset{(1)}{\Rightarrow} u \overset{(2)}{=} xyz + \psi(z)$$

$$\Rightarrow \left.\begin{aligned} u_z &= xy + \psi'(z) \\ u_z &\overset{***}{=} xy + 1 \end{aligned}\right\} \Rightarrow$$

$$\Rightarrow \psi'(z) = 1 \Rightarrow \psi(z) = z + C$$

$$\overset{(2)}{\Rightarrow} u = xyz + z + C$$

PREIZKUS: $\operatorname{grad} u = (yz, xz, xy+1) \Rightarrow \vec{a}$ JE POTENC. POLJE