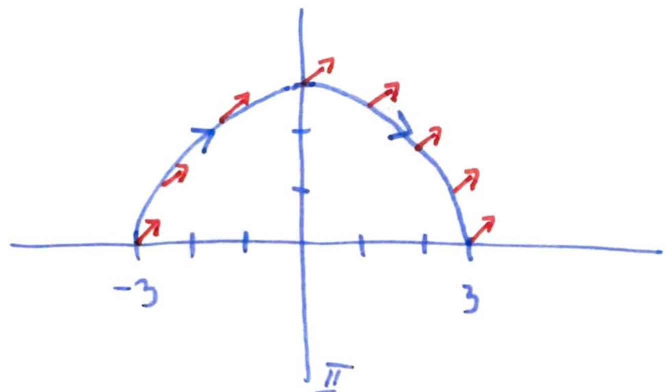
(1) $x = 3\sin t$ $\qquad dx = 3\cos t\, dt$

$y = 3\cos t\,,\ t \in \langle -\frac{\pi}{2}, \frac{\pi}{2} \rangle$ $\qquad dy = -3\sin t\, dt$

kružnice $-\ S = [0,0]$

$r = 3 \qquad y \geq 0$

$$\vec{F}(x,y) = \left(\frac{1}{\sqrt{x^2+y^2}}, \frac{1}{\sqrt{x^2+y^2}} \right)$$



pro $x^2+y^2 = 9$

$$\vec{F} = \left(\frac{1}{3}, \frac{1}{3} \right)$$

$$\int_K \vec{F} \cdot d\vec{r} = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left(\frac{1}{3}\, 3\cos t - \frac{1}{3}\, 3\sin t \right) dt =$$

$$= \Big[\sin t + \cos t \Big]_{-\frac{\pi}{2}}^{\frac{\pi}{2}} = \underline{\underline{2}}$$

(3) $$\int_K (x-z)\,dx + (1-xy)\,dy + y\,dz$$

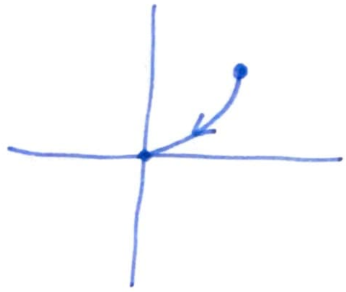
$K:\ x = t\,,\ y = t^2\,,\ z = t^3\,,\ t \in \langle 0, 1 \rangle$

$$= \int_0^1 \Big[(t - t^3) \cdot 1 + (1 - t^3)\, 2t + t^2 \cdot 3t^2 \Big] dt =$$

$$= \int_0^1 (t^4 - t^3 + 3t)\, dt = \left[\frac{t^5}{5} - \frac{t^4}{4} + \frac{3t^2}{2} \right]_0^1 = \underline{\underline{\frac{29}{20}}}$$

② $\displaystyle\int_K \left(x \sin y, \frac{y}{1+x^2}\right) dr$

$K: \quad y = x^2 \quad$ p.b $(1,1)$ k.b. $(0,0)$



$x = -t$
$y = t^2 \quad t \in \langle -1, 0 \rangle$

$$I = \int_{-1}^{0} \left(-t \sin t^2 \cdot (-1) + \frac{t^2}{1+t^2} 2t\right) dt =$$

$$= \int_{-1}^{0} \left(t \cdot \sin t^2 + \frac{2t^3}{1+t^2}\right) dt = *$$

$$\int t \sin t^2 \, dt = \frac{1}{2} \int \sin u \, du = -\frac{1}{2} \cos t^2$$

$$\int \frac{2t^3}{1+t^2} dt = \int 2t - \frac{2t}{t^2+1} \, dt = t^2 - \ln(t^2+1)$$

$$* = \left[-\frac{1}{2} \cos t^2 + t^2 - \ln(t^2+1)\right]_{-1}^{0} = -\frac{1}{2} + \frac{1}{2} \cos 1 - 1 + \ln 2$$

$$= \frac{1}{2} \cos 1 - \frac{3}{2} + \ln 2$$