EXERCISES, Week 4 (submit by 07.11.2016)

1. Compute $\int_\gamma (x+y)\,ds$, where γ is the boundary of the triangle in $\mathbb{R}^2$ with vertices at $(0,0)$, $(1,0)$, $(0,1)$.

2. Compute $\int_\gamma xy\,ds$, where γ is the part of the circle $x^2+y^2=1$ located in the positive quadrant $\{(x,y) \mid x \geq 0, y \geq 0\}$.

3. Compute $\int_\gamma z\,ds$, where γ is the helix in $\mathbb{R}^3$, $\{(x,y,z) \mid x = t\cos t,\ y = t\sin t,\ z = t,\ 0 \leq t \leq 2\pi\}$.

4. Compute $\int_\gamma xy\,dx$, where γ is the oriented curve $\{(x,y) \mid y = \sin x,\ 0 \leq x \leq \pi\}$ with the orientation from $x=0$ to $x=\pi$.

5. Compute $\int_\gamma 2xy\,dx + x^2\,dy$, where γ is the oriented curve $\{(x,y) \mid y = \frac{x^2}{4},\ 0 \leq x \leq 2\}$ with the orientation from $x=0$ to $x=2$.

6. Compute $\int_\gamma (y+z)\,dx + (z+x)\,dy + (x+y)\,dz$, where γ is the oriented curve $\{(x,y,z) \mid x = \sin^2 t,\ y = 2\sin t\cos t,\ z = \cos^2 t,\ 0 \leq t \leq \pi\}$ with the orientation from $t=0$ to $t=\pi$.