

## Homework 10, due Friday 3/31

1. p. 427, problems 2 (a), 3 (b), 5
2. p. 447, problems 1 (b), (d), 2 (a), (c), (d), (3)
3. Let  $C$  be the triangle given by  $A = (0, 0)$ ,  $B = (0, 1)$ ,  $C = (1, 1)$ . View  $C$  as a directed simple curve with counterclockwise orientation. Compute  $\int_C \mathbf{F} \cdot d\mathbf{s}$  with  $\mathbf{F}(x, y) = (\sin(x)y, -yx)$ .
4. p. 448, problems 6, 7 (for  $n = 1$  and  $n = 2$ ), 9, 12.
5. We saw in class that a line integral  $\int \mathbf{F} \cdot d\mathbf{s}$  changes the sign if we change the orientation of the curve. What happens for a path integral, if one changes the orientation?
6. Let  $c$  be a curve from a point  $P$  to a point  $Q$ . Furthermore let  $\mathbf{F}(x, y, z)$  be a vector field, and  $f(x, y, z)$  a function. Now assume we walk from  $P$  to  $Q$ , in the middle we realize that we forgot our wallet, walk back to  $P$  and then walk from  $P$  to  $Q$ . How does this detour affect the line integral of  $\mathbf{F}(x, y, z)$ , and how does it affect the path integral of  $f(x, y, z)$ .