Quiz 9

1) Consider the line integral $\int_C x^2(y+1)dx + x\sqrt{y}\,dy$, where C consists of the arc of the parabola $y = x^2$ from $(0,0)$ to $(1,1)$ and two line segments from $(1,1)$ to $(0,1)$ and from $(0,1)$ to $(0,0)$.

   a) Plot the region D bounded by the simple closed curve C.

(4 points)

   b) Use part (a) and Green Theorem to evaluate the line integral.

(8 points)

2) Find the $curl$ and the divergence of the vector field $\boldsymbol{F}(x,y) = e^{xy}\,\boldsymbol{i} + x\sin(y)\,\boldsymbol{j}$

(8 points)