Homework Set 13

DUE: DEC 9, 2019 (AT THE BEGINNING OF CLASS)

To be handed in:

Please write your solution to Problem 1 on a single sheet of paper!

1. Use Green's Theorem to compute the following line integrals (all curves are oriented counter-clockwise):

   a) $\displaystyle\int_\gamma \vec{F}\,\mathrm{d}\gamma$, where γ is the boundary of the region enclosed by $y = x^2$ and $x = y^2$, and $\vec{F} = \big(y + e^{\sqrt{x}}, 2x + \cos(y^2)\big)$.

   b) $\displaystyle\int_\gamma xy\,\mathrm{d}x + 2x^2\,\mathrm{d}y$, where γ consists of the line segment joining $(-2, 0)$ to $(2, 0)$ and the semicircle $x^2 + y^2 = 4$, $y \geq 0$.

   c) $\displaystyle\int_\gamma \big(xy + e^{x^2}\big)\mathrm{d}x + \big(x^2 - \ln(1 + y)\big)\mathrm{d}y$, where γ is the closed curve formed by the line segment joining $(0, 0)$ to $(\pi, 0)$ and $y = \sin x$.

NOT to be handed in (but recommended for you to practice with):

2. Textbook (5th edition) Section 15.4, Exercises 7-10, 47-49