MATH 203 Calculus III
Homework LAST!!!

Basic Information

This assignment is due on Gradescope by **1:30 PM on Tuesday, May 6**.

Make sure you understand MHC honor code and have carefully read and understood the additional information on the class syllabus. Since this is a 200-level mathematics course, quite a few homework questions will ask you to explain your reasoning or process for solving a problem. Whenever possible, write your explanations in complete sentences and write your answers as if you were explaining to a peer in the class.

Turn In Problems

14.4: 10, 14, 16

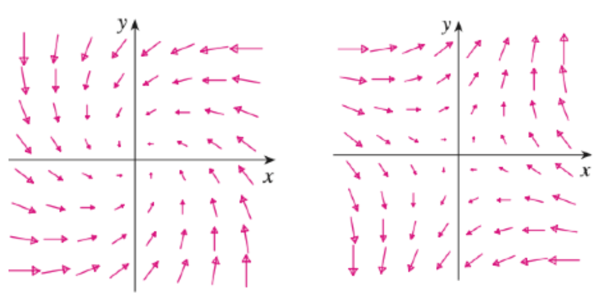
#4. Use Green's Theorem to evaluate the line integral $\oint_C \vec{F} \bullet d\vec{r}$ where $\vec{F}(x, y) = \langle xy^2,\ 2x^2y \rangle$ and C is the positively oriented curve that is the boundary of the triangle with vertices (0,0), (2,2), and (2,4).
Note: this question is only asking you to use the double integral to find the line integral, not to verify both parts of Green's Theorem.

#5. Suppose we have a vector field $\vec{F}(x, y, z) = \langle M, N, P \rangle$ so that M, N, and P have continuous second-order partial derivatives. In this case the divergence of the curl of $\vec{F}$ is zero, in other words,

$$\text{div curl } \vec{F} = 0. \tag{1}$$

(Note that curl $\vec{F}$ is itself a vector field so we can compute the divergence of it!) Use the definitions of divergence and curl in relation to the operator ∇ to explain why that equation (1) above is true.

#6. Below are two vector fields. Determine if they appear to be conservative or not. Be sure to explain your answers.



I II

Additional Problems (to do on your own, not to turn in)

14.4: 9, 15, 19