MATH 203 Calculus III
Homework LAST!!!

Basic Information

This assignment is due on Gradescope by **3 PM on Tuesday, December 10**.

Make sure you understand MHC honor code and have carefully read and understood the additional information on the class syllabus. I am happy to discuss any questions or concerns you have!

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.

The homework problems will be graded anonymously so please do not put your name or other identifying information on the pages.

Turn In Problems

14.4: 10, 16

#3. 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).

#4. 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 prove that equation (1) above is true.

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

14.4: 9, 15, 19