Basic Information

This assignment is due on Gradescope by **1:30 PM on Friday, April 25**.

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

14.2: 12, 16

14.3: 8, 12. (Just set up #12, no need to integrate it.)

#5[1]. Find the gradient vector field of $f(x,y) = xe^{xy}$.

#6. To the right are plots of 4 vector fields. Match those with the vector fields listed below:

   (a) $\vec{F}(x,y) = \langle y, x \rangle$
   (b) $\vec{F}(x,y) = \langle 1, \sin y \rangle$
   (c) $\vec{F}(x,y) = \langle x - 2, x + 1 \rangle$
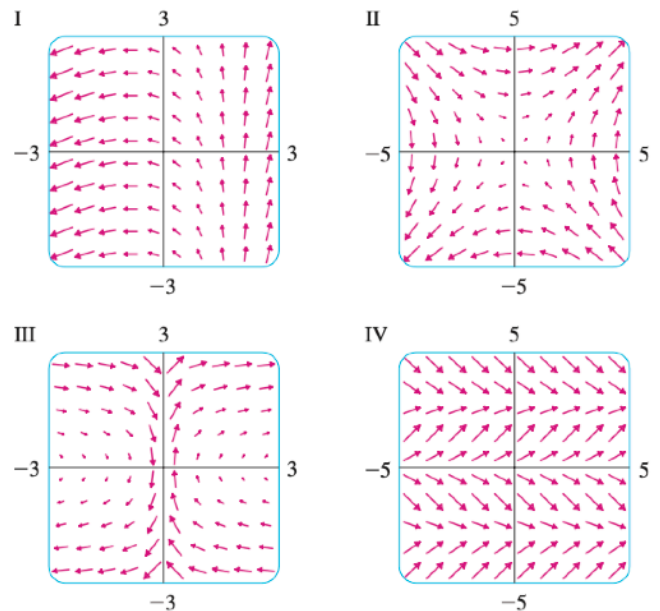   (d) $\vec{F}(x,y) = \langle y, 1/x \rangle$

#7. For the following vector fields, either show they are not conservative or find a potential function for them.

   (a) $\vec{F}(x,y,z) = \langle \cos(xz),\ \sin(yz),\ xy \sin z \rangle$
   (b) $\vec{F}(x,y,z) = \langle y^2,\ 2xy + e^z,\ ye^z \rangle$

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

14.2: 11, 15

14.3: 9, 11

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[1] #6 and 7, and the last problem in the additional problems section are from Stewart Calculus 6th edition, pages 1032 and 1043.

- Find the gradient vector field of $f(x, y) = \tan(3x - 4y)$.
- For the following vector fields, either show they are not conservative or find a potential function for them.

  (a) $\vec{F}(x, y, z) = \langle \cos z, \; 2y, \; -x \sin z \rangle$

  (b) $\vec{F}(x, y) = \langle xe^y, \; ye^x \rangle$