Basic Information

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

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

- 9.4: 6, 10, 48
- #4. Sketch the region in the xy plane consisting of points whose polar coordinates satisfy the following conditions.
    - (a) $r > 1$
    - (b) $1 \leq r < 3$ and $-\pi/4 \leq \theta \leq \pi/4$
    - (c) $-1 \leq r \leq 1$ and $\pi/4 \leq \theta \leq 3\pi/4$
- #5. Evaluate the following two integrals:
    - (a) $\displaystyle\int_1^4 \sqrt{t}\ln t \; dt$
    - (b) $\displaystyle\int x \cos(x^2) \; dx$
- #6. Use Lagrange multipliers to find the maximum and minimum values of the function $f(x,y) = x^2 - y^2$ subject to the constraint $x^2 + y^2 = 1$.

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

- 9.4: 5, 9, 47
- Use Lagrange multipliers to find the maximum and minimum values of:
    - (a) the function $f(x,y) = x^2 + y^2$ subject to the given constraint $x^4 + y^4 = 1$,
    - (b) the function $f(x,y,z) = 8x - 4z$ subject to the constraint $x^2 + 10y^2 + z^2 = 5$.