MTH 233-001 Final Exam Information

The 100-point final exam will consist of two portions: a 30-point take-home portion and a 70-point in-class portion. The take-home portion will be available Friday, December 9, and it will be due Thursday, December 15. Ten points per day will be deducted for late submissions. The in-class portion is scheduled for our last day of class (Thursday, December 15).

Your final exam will consist of eighteen 5-point problems and one 10-point problem (a double 5-pointer!)---one problem from each of the section objectives listed below. Each answer will have the form of a single number, a single mathematical expression, a short phrase, or a sentence. The answer itself will be worth **up to** 2 points. The supporting work or explanation will be worth **up to** 3 points. The supporting work will be scored as follows:

- 0 points - No work or no correct work/explanation
- 1 point - Some correct ideas and work/explanation
- 2 points - The ideas and work/explanation are mostly correct
- 3 points - The ideas, notation, and work/explanation are correct

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Final exams skills list

1. Use the dot product in applications involving orthogonality, work, angles between vectors, projections, etc. (Section 2.3)
2. Use the cross product in applications of area, volume, and torque. (Section 2.4)
3. Find parametric or symmetric equations for a line in space. (Section 2.5)
4. Determine the length of a plane or space curve defined by a vector-valued function. (Section 3.3)
5. Solve a projectile motion problem in space. (Section 3.4)
6. Compute the limit of a multi-variable function. (Section 4.2)
7. Use the two-path test to show that a limit does not exist. (Section 4.2)
8. Compute the total differential of a function and use it to approximate change. (Section 4.4)
9. Find an equation of the plane tangent to a given surface at a point. (Section 4.4)
10. Compute directional derivatives and interpret them as slopes. (Section 4.6)
11. Find the critical points of a function of two variables. Use the second partials test to classify critical points. (Section 4.7)
12. Write a double integral as an iterated integral and evaluate. (Section 5.2)
13. Change the order of integration in a double integral. (Section 5.2)
14. Use double integrals in polar coordinates to compute areas and volumes. (Section 5.3)
15. Evaluate a triple integral by converting to cylindrical coordinates. (Section 5.5)
16. Use a triple integral to find the mass of a solid in space. (Section 5.6)
17. Evaluate line integrals. (Section 6.2)
18. Use the Fundamental Theorem of Line Integrals to compute the line integral of a conservative vector field. (Section 6.3)*
19. Apply Green's theorem. (Section 6.4)