MTH 233-950 Final Exam Information

The 100-point final exam will consist of two portions: a 40-point take-home portion and a 60-point in-class portion. The take-home portion will be posted Saturday, May 8, and it will be due Thursday, May 13. The in-class portion of the final will occur during class on Thursday, May 13.

Your final exam will consist of twenty 5-point problems---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 exam section objectives

1. Find and use the projection of one vector onto another. (Section 2.3)
2. Find a vector orthogonal to two given vectors. (Section 2.4)
3. Find parametric or symmetric equations for a line in space. (Section 2.5)
4. Find the angle between two planes. (Section 2.5)
5. Determine the length of a plane or space curve defined by a vector-valued function. (Section 3.3)
6. Solve a projectile motion problem in space. (Section 3.4)
7. Compute the limit of a multi-variable function. (Section 4.2)
8. Use the two-path test to show that a limit does not exist. (Section 4.2)
9. Describe the conditions for equality of higher-order mixed partial derivatives. (Section 4.3)
10. Compute the total differential of a function and use it to approximate change. (Section 4.4)
11. Find an equation of the plane tangent to a given surface at a point. (Section 4.4)
12. Compute directional derivatives and interpret them as slopes. (Section 4.6)
13. Use gradient vectors to determine the direction of maximum increase/decrease. (Section 4.6)
14. Find the critical points of a function of two variables. Use the second partials test to classify critical points. (Section 4.7)
15. Write a double integral as an iterated integral and evaluate. (Section 5.2)
16. Change the order of integration in a double integral. (Section 5.2)
17. In applications of double integrals, convert from rectangular to polar coordinates or vice versa. (Section 5.3)
18. Evaluate a triple integral by converting to cylindrical coordinates. (Section 5.5)
19. Use a triple integral to find the mass of a solid in space. (Section 5.6)
20. Evaluate line integrals. (Sections 6.1-6.3)