# MTH 233-001 Final Exam Information

Our cumulative 100-point final exam will consist of ten 10-point problems. Three of those problems will be take-home problems, assigned on May 3 and due on May 9. The remaining seven problems will be in-class problems on May 9 during our last class meeting. In order to receive full credit for the problems, you must show all work or supply explanations that support your answer. The take-home problems must be worked individually.

The final exam will cover the objectives listed below. Focus your studying on these skills.

---

## Final exams skills list

1. Find parametric or symmetric equations for a line in space. (Section 2.5)
2. Find the angle between two planes. (Section 2.5)
3. Compute the unit tangent vector for a vector-valued function. (Section 3.2)
4. Find the arc-length parameterization for a smooth curve. (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. Use gradient vectors as normal vectors. (Section 4.6)
10. Find an equation of the plane tangent to a given surface at a point. (Section 4.4)
11. Find parametric equations for the line normal to a given surface at a point. (Section 4.4)
12. Compute directional derivatives and interpret them as slopes. (Section 4.6)
13. Find the critical points of a function of two variables. Use the second partials test to classify critical points. (Section 4.7)
14. Write a double integral as an iterated integral and evaluate. (Section 5.2)
15. Change the order of integration in a double integral. (Section 5.2)
16. Use double integrals in polar coordinates to compute areas and volumes. (Section 5.3)
17. Use a triple integral to compute the average value of a function over a space region. (Section 5.5)
18. Evaluate a triple integral by converting to cylindrical coordinates. (Section 5.5)
19. Evaluate line integrals. (Section 6.2)
20. Apply Green's theorem. (Section 6.4)