

**Math 1431 Fall 2017: Exam 4 Review**  
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The reviews for Exams 1–3 contain the relevant material for Exam 4. I suggest studying these reviews, as well as the first three exams. Exam 4 will focus on the following problem types.

- (1) Computing derivatives
  - Using the limit definition
  - Using theory
- (2) Related rates
- (3) Exponential growth/decay
- (4) Optimization
- (5) Mean value theorem/Rolle's theorem
- (6) First and second derivative analysis
- (7) L'Hospital rule
- (8) Fundamental theorem of calculus
- (9) Computing integrals
  - Basic integrands
  - Substitution
  - Integration by parts
- (10) Applications of the integral
  - Area between curves
  - Volumes of solids of revolution (disks, washers, shells)
  - Motion in one dimension (position, velocity, acceleration, total distance traveled)
  - Work (Hooke's law)