

## MATH 129 FINAL EXAM INFORMATION – SPRING 2017

### PROCEDURES

- The final exam is on **Monday May 8, from 8:00 – 10:00 am**. Do not be late. You will not be given additional time if you arrive after 8:00 am. We recommend arriving 15 min. early.
- If you use DRC testing accommodations, arrive 15 minutes early to the DRC testing office.
- The final exam is NOT given in your usual classroom. You will find the room assignments at <http://math.arizona.edu/academics/courses/finals> (scroll down to the bottom of the page). You will not be allowed to take the final in a room other than the one assigned to your section.
- You will not be allowed to leave the exam room until 9:00 am.
- Because several sections are assigned to a room, students in each section need to sit together. Additional directions, such as sitting every other seat, will be given at the exam site.
- All cell phones and electronic devices (including iPods, laptops, and language translators) that transmit or receive a wireless signal must be turned off and put away during the exam. Vibrate or silence modes are not allowed.
- Bring your graphing calculator. Models that can perform symbolic calculations are NOT allowed on the final exam. These include the TI-89, TI NSpire CAS, HP 50g, and Casio Classpad 330. Using one of these models during the exam is considered a violation of the UA Code of Academic Integrity.
- Students are not allowed to share calculators during the exam. Calculator covers must be removed and put away.
- Bring a picture ID.

### ABOUT THE FINAL EXAM AND GRADING

- The final exam study guide is posted at <http://math.arizona.edu/~calc/m129.html>. Although the questions in the guide are not samples of actual exam questions, they provide an excellent review of the topics that are covered on the exam.
- A past final exam is posted at <http://math.arizona.edu/~calc/m129.html>. Use this as practice for length and range of topics. It is not a sample of what this semester's final exam will look like.
- No formula sheets or notes of any kind are allowed. You are not allowed to use your own paper. If you need additional space for a solution, you must use paper provided by the proctors.
- The integral table and Taylor series table posted at <http://math.arizona.edu/~calc/m129.html> will be provided on the exam. Familiarize yourself with the tables. You are strongly encouraged to use these on any applicable questions unless instructed otherwise.
- Except where noted, you must show all work clearly to get credit. In order to receive credit, your final answer must follow from your work even if your answer is correct.
- Graders are not expected to interpret the intention of your work or to choose from multiple solutions on your paper. If you provide two different solutions without clearly indicating which solution you want graded, it is very likely that neither solution will be graded.
- Units should be included in your answers for all questions involving units even if there are no explicit instructions to do so.
- The wording and notation used in the questions are consistent to what is found in the text, WebAssign, and the final exam study guide.
- Instructors were given the option of covering either physics applications (section 8.5) or probability (section 8.7/8.8). The question on your version of the final exam will reflect the choice of topic that your instructor made. The question will be similar to those from the text, WebAssign homework, and study guide.

## QUESTION TYPES

- Pay close attention to the instructions in the questions. For example - SET UP the integral means you should not waste time evaluating the integral after setting it up.
- Some questions might have a short answer format. A short answer could refer to an explanation or a justification. For example – Determine if a series or integral converges or diverges, justify your answer. Justification could include calculations, illustrations, and/or clear explanations. Always include the name of the test or process you are using.
- A question might ask for a function or equation that illustrates something. For example - Give an example of a differential equation with two equilibrium solutions or give an example of an infinite geometric series that converges and then find its sum.
- Some questions might have a multiple choice, matching, or True/False format. These formats are reserved for questions in which wrong answers would not receive partial credit anyway.

## EXACT ANSWERS AND ESTIMATES

- Unless specifically asked to estimate, your final answers should be given in exact simplified form. For example - if your answer is  $\cos(\pi/4)$ , your final answer must be  $\sqrt{2}/2$  or  $1/\sqrt{2}$ .
- You should not use approximation techniques unless specifically told to do so. For example - do not use the numerical integration feature on your calculator if the Fundamental Theorem can be used to evaluate a definite integral.
- When only an estimate is possible you must clearly show how you obtained your estimate and the values you used to obtain your estimate in order to receive credit for a correct answer. For example – show the values you use when finding the Midpoint rule with  $n = 3$  given a graph.

## FUNCTIONS AND EQUATIONS

- Functions can be given in any form (tables, graphs, equations, words).
- Any function type can appear: polynomial, power, rational, exponential, logarithmic, trig, inverse trig ( $\arcsin x$ ,  $\arctan x$ ), absolute value, and piecewise defined. No hyperbolic functions.
- Equations and functions can include parameters.

## YOU NEED TO KNOW..... (not a complete list)

- the terminology used throughout this course. Terms and phrases include, but are not limited to,
  - Riemann sum, solids of known cross-section, method of slicing, density, mass,
  - general term of a sequence or series, closed form, power series, radius and interval of convergence, expand an expression as a power series,
  - initial value problem, parameters, slope field, stable/unstable equilibrium solutions
  - work - if physics (8.5) was covered, density and distribution - if probability (8.7/8.7) was covered.
- the integration techniques and when to use them: substitution, integration by parts, partial fractions, and trigonometric substitution.
- algebraic techniques needed to rewrite an integrand: factoring, completing the square and polynomial long division.
- Midpoint and Trapezoid rules for a small choice of  $n$  given a table or graph and know when the rules provide under or over estimates.
- geometry formulas: volume of a cylinder and box; area of a rectangle, triangle, and circle; Pythagorean Theorem, ratios for similar right triangles.
- how to use the method of slicing to set up a definite integral.

- the difference between convergence of a sequence and convergence of a series.
- the closed form for the sum of a finite or infinite geometric series.
- the integral, ratio, and limit comparison tests for convergence of a series.
- the relationships between convergence and divergence of  $\sum a_n$ ,  $\sum |a_n|$ , and  $\sum b_n$  for  $b_n < a_n$  or  $b_n > a_n$ .
- how to find the ratio and interval of convergence (you will not need to investigate convergence at the endpoints).
- how to make comparisons of improper integrals and infinite series using  $\int \frac{1}{x^p} dx$  and  $\sum \frac{1}{n^p}$ .
- how to find and use Taylor polynomials and series.
- how to set up and then solve an initial value problem using separation of variables.
- No questions will ask specifically about conditional versus absolute convergence.
- No questions will require the specific use of a calculator program (Allsums or Slopefield).