Information for Students about the MATH 101 Final Examination

April 20, 2014

1. The MATH 101 final examination will be held on Friday, April 25, 2014 starting at 3:30 p.m. and will run for 2.5 hours. You will write the exam in the location for your section that has been assigned by Enrolment Services. You can find this on the exam schedule or via the SSC.

2. Students should bring their UBC student card to the exam as identification. Students without any photo ID may be photographed and then required to produce their student cards after the exam is completed.

3. This is a closed-book exam. No formula sheets are allowed, nor will one be provided.

4. **No calculators will be allowed and having one constitutes academic misconduct.**

5. Students may NOT have a pencil case on or around them during this exam. Students may have a reasonable number (≤ 4) of pens and/or pencils on the exam. **No eraser tape or fluid (e.g. whiteout) may be used on the exam.**

6. Students may NOT have cell phones, or other electronic devices on or near them during this exam. **A cell phone that goes off during the exam will be treated as an attempt by the student to disrupt the exam.**

7. Students may not wear ball caps or "hoodies" or other head coverings that obscure the face during the exam. Head or face coverings worn for religious reasons are acceptable.

8. **The final exam covers the material in the course, which is generally captured by the learning goals for the course.**

9. About 40% of the exam will be short answer questions. These questions are worth 3 marks each, with part marks possible. The only possible grades for each short answer question are 0,1,2, or 3.

10. About 60% of the exam will be long answer questions. Each questions will be of roughly equal value, but not necessarily equal difficulty. Part

marks are possible, but all grades will be whole number values – that is, there are no half-marks.

11. There are various formulae that are a natural part of this course. For example, you should know the formula for integration-by-parts, the general form for partial fractions, etc. No formula sheet will be given.

12. You should know the following trigonometric identities: $\sin^2 x + \cos^2 x = 1$ and its variants (e.g. $1 + \tan^2 x = \sec^2 x$); $\cos^2 x = (1 + \cos 2x)/2$, $\sin^2 x = (1 - \cos 2x)/2$, $\sin 2x = 2 \sin x \cos x$, and $\cos 2x = \cos^2 x - \sin^2 x$. You are also expected to know the basic properties of trigonometric functions.

13. You should know the basic formula for generating the coefficients of a Taylor series. You should need to know how to find an upper bound on the absolute error when you use the Taylor polynomial of degree n to approximate the value of a function.

14. You should know the Maclaurin series for e^x, $\ln(1 + x)$, $1/(1 - x)$ (the geometric series), $\sin(x)$, and $\cos(x)$.

15. If needed, you will be given the formulae: $\sum_{k=1}^{n} k = n(n + 1)/2$ and $\sum_{k=1}^{n} k^2 = n(n + 1)(2n + 1)/6$, etc.

16. If needed, formulae that can be used to determine upper bounds on the absolute errors that arise when using the Midpoint, Trapezoid, and Simpson's Rules will be given on the exam.

17. You do not need to memorize the formula for $\int \sec x \, dx$.

18. You are expected to know the basic results from your prior differential calculus course. For example, it would be reasonable for us to ask you to find the interval(s) on which the curve $y = \int_0^x \frac{1}{1+t+t^2} \, dt$ is concave upward.

19. The following comments give some guidance on expectations for the midterm exam concerning grading.

    - **The grading on any question is based on a mastery marking scheme: students are expected to demonstrate both conceptual and technical mastery to earn an A-level grade on a question.** In a single question, once a student makes an error, the student will be marked down, but there are still part

marks possible for the remainder of the question. In general, in the case of simple arithmetic errors, students would receive most of the remaining marks if they proceeded correctly after the error.

- Put your answers into calculator-ready forms, which are formed of numbers and standard functions (e.g. e^x, $\sin(x)$, etc.). These calculator-ready forms need not be simplified. For example, both $\arcsin(1/2)$ and $1000e^{-0.05}$ are in calculator-ready form.
- The grader should not have to decipher an answer. An answer in which it is unclear if there is a + or - sign, for example, will be deemed one way or the other by the best guess of the grader. An example is a - sign that has been erased but is still visible; the assumption is a + sign in that case.
- Erased or crossed out work will not be counted against a student. Multiple solutions where one answer is wrong normally will be marked down even if one of the answers is correct.
- Incorrect mathematics included in a solution, even if the overall solution reaches the correct answer, will be marked down. An example would be if a student were to use correctly the quadratic formula to find the roots of a quadratic equation that appears in their solution, but include in the space given for their solution an incorrect calculation based on factoring the given quadratic as part of another attempt at solving the quadratic equation.