

FINAL EXAM INFORMATION – MATH 3210
FALL 2018

There will be 6 pages of regular problems, plus one page of extra credit problems on the final. There will be an emphasis on material from chapter 6.

- The first two pages will be short answer questions. I may ask you to define terms. I may ask you to state a theorem. I may ask you to prove something very short. I may ask you for an example of something. I may ask for a short computation.
- The third page will ask you to compute something specific. Perhaps using series, or integrals, or derivatives, or limits, or...? (Can I combine series, L'Hôpital's rule, and the second fundamental theorem of calculus into one problem?)
- The fourth page will ask you to prove some limit exists and/or sequence converges. You will be expected to do this from the definition (in other words, to do a $\delta - \epsilon$ or $\epsilon - N$ proof).
- The fifth page will be a more abstract proof.
- The sixth page will ask you to prove one of the following 5 theorems.
 - (a) The Mean Value Theorem (Theorem 4.3.2 in the text).
 - (b) That the field of real numbers has the Archimedean property, using the completeness axiom. Theorem 1.4.8 in the text.
 - (c) The Bolzano-Weierstrass theorem (you may use the Nested Interval Property). Theorem 2.5.5. in the text.
 - (b) A part of the second Fundamental Theorem of Calculus (Theorem 5.3.3 in the text). In particular, you may need to show the part where one shows that $F'(x) = f(x)$ assuming f is continuous at x . Thus I will *not* ask you to prove that $F(x)$ is continuous.
 - (e) Taylor's formula, Theorem 6.5.3 in the text.
- The seventh page will be an extra credit problem (worth up to +10 points to the exam, out of 100). It will require a more subtle proof.