

**Math 1A**  
**Midterm 3 Review**

Midterm 3 is currently scheduled to include sections 4.1–4.5, 4.7.

[0] **Do all assigned homework before you look at the review.**  
If you skip the homework and only practice this review material, you will probably not be able to finish the midterm in the allotted time because you have to spend too much time trying to remember what the reasoning is or what you should do next.

[1] Know the definitions, theorems and tests. Review the handouts from my website.

Definition of absolute/global/relative/local maximum/minimum  
Definition of critical number  
Definition of increasing/decreasing function (from lecture and chapter 1)  
Definition of concave up/down (from lecture, **not the textbook**)  
Definition of inflection point

Extreme Value Theorem  
Rolle's Theorem  
Mean Value Theorem

First Derivative Test for local extrema  
Second Derivative Test for local extrema  
(what these two tests tell you, and when they can or **cannot** be used)

[2] Review all individual quiz questions and their solutions.

[3] Practice as many graphing (4.5) and optimization (4.7) problems as possible using the processes in the handout.  
**No specific questions are singled out from these two sections in the review material below.**

[4] Make sure you know how to solve the following problems, and **show the reasoning and full process behind your solutions.**

Do not use shortcuts, and do not skip steps.

Where relevant, watch out for discontinuities, endpoints, points outside the domain, and points in the domain where the first or second derivative are undefined.

**As you do these questions, if you find you don't know the next step without looking it up or thinking about it a lot, then you haven't gotten enough practice from the homework yet, so go back and do more before you continue with the review.**

4.1 39 (**find the absolute extrema, not just the critical numbers**)  
4.2 3, 8, 9, 13, 17, 21, 37  
4.3 22, 30, 35, 68, 73  
4.4 1–4, 17, 19, 49, 65  
4.5 lecture examples, textbook examples and assigned homework  
4.7 lecture examples, textbook examples and assigned homework  
Chapter 4 Review True–False Quiz (Page 358)  
1–15, 19–21

You should be able to do all questions without a calculator.