MULTIVARIABLE CALCULUS

MATH S-21A

Seminar Week 4

400.1. In this seminar part, we review a few parts of the week.

ASSESSMENT AND REVIEW

This Assessment is also due on , 7/21/2020, together with the other 4 assignments.

Problem 400.1: a) What was the most interesting thing you have seen this week?
b) What was the most difficult thing you have seen this week?

Problem 400.2: Explain in your own words, what can happen if $D = 0$. Given in particular an example where we have a maximum, where we have a minimum, or where we have neither a maximum nor a minimum.

Problem 400.3: Make a list of all definitions and notations you have seen this week.

Problem 400.4: Make a list of all theorems and formulas seen this week.

Problem 400.5: We mentioned the **Monte Carlo method** which allows to compute areas using random processes. Your task is to get as accurate value for the area of the Mandelbrot set as possible. Catch up back to your **rare element group** which now form small competitive research teams. Each group tries to get an as accurate value for the area as possible. Each group sends me also the most accurate value. You also include the rational value you got from your group here in this problem. Here is an example answer (which is the answer when running the code below) **We ran with 1000 iterations and 1000000 points and got 377577/250000.**

```
M=Compile[{x,y},Module[{z=x+I y,k=0},
      While[Abs[z]<2.&&k<1000,z=N[z^2+x+I y];++k];Floor[k/1000]]];
9*Sum[M[-2+3 Random[],-1.5+3 Random[]],{1000000}]/1000000
```

Multivariable Calculus

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