Math 1152 Written Homework 4

Due: Tuesday, June 7th in Gradescope.

- Calculators are permitted EXCEPT those calculators that have symbolic algebra or calculus capabilities.
- SHOW ALL WORK!
- A completed version of this document is due to be uploaded to Gradescope by 11:59pm on **Tuesday, June 7th**.
- If you have difficulties using Gradescope, see pages under the Gradescope header in the Modules section of our Carmen page for help.
- Ideally, this can be completed on an iPad or android tablet using an app like One Note, Notability, Papyrus, etc. - if you don't have access to one of these options,then printing and scanning or using a smartphone document-scanning feature to generate a pdf to upload will also work.
- If you have difficulties uploading the assignment, email a pdf to your recitation instructor.
- This homework will be graded via random subset selection - not every part of every question will be looked at by the grader.
- Rubrics to applicable questions will be provided later.

Question 1.

a. Use "dominant term analysis" and growth rates to determine and justify the limit of the sequence

$$a_n = \frac{2^n + e^{\sqrt{\log(n)}}}{\log(n)}.$$

If a term appears which does not follow from the standard growth rate comparisons, you should determine it's relative rate of growth using either L'Hospital's Rule or by appropriate algebraic and analytic manipulations.

b. Use the Squeeze Theorem to determine the limit of the sequence

$$b_n = \frac{2^n + e^{\sqrt{\log(n)}}}{\log(n) + (-1)^n}.$$