

Math 9A - Course Expectations and Learning Mathematics

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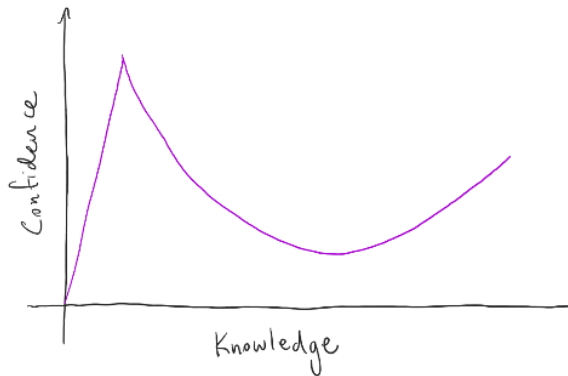
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September 25, 2019

- ▶ **Our focus:** Learning and obtaining introductory knowledge of single variable calculus.
- ▶ **Two motivations:**
 1. Increase amount of content knowledge and literacy in mathematics.
 2. Improve critical thinking and reasoning abilities. *“Problem solving!”*
- ▶ **My experience suggests...**
 - ▶ Learning is difficult.
 - ▶ Mathematics is difficult.
- ▶ **Performance evaluation:** Note that there is a difference between knowing and mastering.
- ▶ **Confidence:** The Dunning-Kruger effect compounds all of these difficulties and challenges.

Dunning-Kruger Effect

The following association between knowledge and confidence has sometimes been observed.



One challenge we might need to overcome is that increasing your knowledge might initially be accompanied by a decrease in confidence.

Role of Long-Term Memory

- ▶ **Problem:** Independently solving mathematics problems requires more advanced understanding than what is often asked on multiple choice exams requiring recognition.
- ▶ **Solution:** Commit content to *long-term memory (LTM)*.

Committing material to LTM requires:

1. Repetition of material
2. Rapid eye movement (REM) sleep cycles in association with repetitions.

An Analogy

- ▶ *“I want to be really fit in two days, so I’m going to work out for 15 hours tomorrow!”*
- ▶ **Similar ideology:** *“I have an exam in two days, so I’m going to study for 15 hours tomorrow!”*
- ▶ This approach loses the ability to get material in LTM and does not produce mastery of material/content in this time frame.
- ▶ In order to help you get the material in LTM, we will try to use the online homework to help you to think about the material for at least a few minutes on most days this quarter.

Thanks for your attention!