

Math 1A: Discussion Exercises

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<http://math.berkeley.edu/~theo/f/09Spring1A/>

Find two or three classmates and a few feet of chalkboard. As a group, try your hand at the following exercises. Be sure to discuss how to solve the exercises — *how* you get the solution is much more important than *whether* you get the solution. If as a group you agree that you all understand a certain type of exercise, move on to later problems. You are not expected to solve all the exercises: in particular, the last few exercises may be very hard.

Many of the exercises are from *Single Variable Calculus: Early Transcendentals for UC Berkeley* by James Stewart; these are marked with an §. Others are my own, or are independently marked.

Σ notation

1. § Write the sum in expanded form. Use ellipses (...) only when necessary.

(a) $\sum_{n=1}^6 \frac{1}{n+1}$

(b) $\sum_{i=4}^6 i^3$

(c) $\sum_{j=n}^{n+3} j^2$

(d) $\sum_{j=0}^{n-1} (-1)^j$

2. § Write the sum in sigma notation.

(a) $\frac{3}{7} + \frac{4}{8} + \frac{5}{9} + \frac{6}{10} + \cdots + \frac{23}{27}$

(c) $\frac{1}{1} + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \cdots + \frac{1}{n^2}$

(b) $\sqrt{3} + \sqrt{4} + \sqrt{5} + \sqrt{6} + \sqrt{7}$

(d) $1 - x + x^2 - x^3 + \cdots + (-1)^n x^n$

3. § Find the value of the sum.

(a) $\sum_{k=0}^8 \cos k\pi$

(b) $\sum_{n=4}^{100} 4$

(c) $\sum_{j=-2}^4 2^{3-j}$

(d) $\sum_{i=1}^n i(i+1)(i+2)$