Wednesday, March 2

Announcements

WeBWorK #7 is due tonight at 9pm

Pick up your quiz papers in the Math Learning Centre

Quiz #4 will take place here on Friday, March 4 (second half of class time)

- Covers material from Week 6 and Week 7
- As usual: no notes, no scratch paper, no phones, no calculators, etc.
- You must bring your student ID to class on every quiz day
- You must take the quiz in the section you're registered in
- You must stop writing when instructed to do so

Thank you for your cooperation with the exam-conditions procedures (especially staying in your seats, and not talking, until all quiz papers have been collected). It helps us a lot! and keeps the quizzes efficient.

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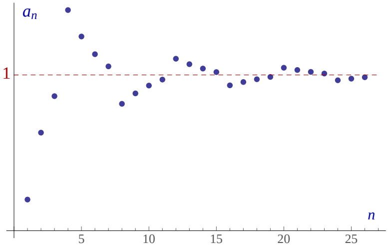
Clicker Questions

Clicker Question 1

Graph of a sequence

Based on the terms of the sequence you can see, does $\{a_n\}$ converge to 1 or not?



A. no, because there's no formula for the values

B. yes, because the values will get as close to 1 as we like if we go far enough

C. no, because some values are above 1 while other values are below 1

D. yes, because each value is closer to 1 than the previous value

E. no, because some values are farther away from 1 than previous values

Clicker Question 2

Will this problem send you to the hospital?

Evaluate $\lim_{n\to\infty} \frac{\log n}{n^{1/9}}$.

A. converges to 9

B. diverges

C. converges to $1/9$

D. converges to 1

E. converges to 0

Using l'Hôpital's Rule

It suffices to calculate $\lim_{x\to\infty} \frac{\log x}{x^{1/9}}$, which is an $\frac{\infty}{\infty}$ indeterminate form. Its limit is therefore equal to

$$\lim_{x\to\infty} \frac{(\log x)'}{(x^{1/9})'} = \lim_{x\to\infty} \frac{1/x}{x^{-8/9}/9}$$

$$= \lim_{x\to\infty} \frac{9}{x^{1/9}} = 0.$$

Clicker Question 3

Applying the Squeeze Theorem

Calculate $\lim_{n\to\infty} \frac{(-1)^n + 2n + 3\cos(4n)}{n}$.

A. 0
B. 1
C. 2
D. 3
E. 4

Two bounding sequences

Since $(-1)^n$ is either -1 or 1, and $3\cos(4n)$ is always between -3 and 3, the limit must lie between

$$\lim_{n\to\infty} \frac{2n-4}{n} \quad \text{and} \quad \lim_{n\to\infty} \frac{2n+4}{n},$$

both of which equal 2.