Math 242 Lab 7
Sequences

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October 20, 2020

Lab Assignment

- Complete ALL Lab Assignment Questions (with codes, computation results, and brief essay questions from page 2~3)
- Submit “lastnameLab07.nb” and “lastnameLab07.pdf” **(File->Save As→pdf)** on Canvas
- Deadline: **Tomorrow 11:59pm**
- Correct computation results (without codes) are available on Canvas→Files→Lab→Lab_07_Sequences→lab07_examples_hints

Table

- Table[Sqrt[i], {i, 1, 10}]

  creates the list $\sqrt{1}, \sqrt{2}, \sqrt{3}, \ldots, \sqrt{10}$
- Table[{i, Sqrt[i]}, {i, 1, 10}]

  creates the list $\{1, \sqrt{1}\}, \{2, \sqrt{2}\}, \{3, \sqrt{3}\}, \ldots, \{10, \sqrt{10}\}$

Abridged table

- Suppose we already defined

  a[n_] = (3 n^2 - (-1)^n*n)/(7 n^2 - 6 n + 4)

  seq = Table[{n, a[n]}, {n, 1, 101}] // N

- Then this code

  seq[[;; ;; 10]] // TableForm // N

  prints every 10th term: 1st, 11th, 21st, …, 101st

Abridged table

- Syntax: **seq[[(starts) ;; (ends) ;; (increment)]]**
- If we left (starts) or (ends) as a space, then it'll use default value (the first and the last term in seq).
- seq[[;; 50;; 10]] will print the 1st, 11th, …, 41st term.
- seq[[2;; ;; 10]] will print the 2nd, 22nd, …, 92nd term.
- seq[[2;; 50;; 10]] will print the 2nd, 22nd, 32nd, 42nd term.
- seq[[3;; 50;; 5]] will print the 3rd, 8th, 13th, …, 43rd, 48th term.

ListPlot

- **ListPlot[seq]**
  Here seq is a two columns table that have been defined, such as seq=Table[{n,a[n]},{n,1,101}]
- **Note:** Do NOT add //TableForm to the definition of seq.

Limit

- Limit[a[n],a->Infinity]

Sum (Q4)

- Syntax: **Sum[(expression in n), {n, n min, n max}]**
- So 0+1+2+3+...+10 is Sum[n, {n, 0, 10}]
- 0+1+2+3+…+n+…(go on forever) is

  Sum[n, {n, 0, Infinity}]
- $\sum_{n=0}^{\infty} f_n$ means f[0]+f[1]+f[2]+…+f[n]+…(go on forever)

  so it’s Sum[f[n], {n, 0, Infinity}]

Wrong

- a[n_] = 3 n^2 - (-1)^n*n/7 n^2 - 6 n + 4
- bn=...
- seq=Table[{n,a[n]},{n,1,101}]//TableForm
  ListPlot[seq]
- ln(n)
- sin(tan(sqrt(…)))

Correct

- a[n_] = (3 n^2 - (-1)^n*n)/(7 n^2 - 6 n + 4)
- b[n_]=…
- seq=Table[{n,a[n]},{n,1,101}]
  ListPlot[seq]
- Log[n]
- Sin[Tan[Sqrt[…]]]
- Remember to modify the names: **b**[n],**c**[n],**d**[n],**f**[n] accordingly everywhere in the codes; or just keep using the same name for every question.