Day 5 (July 2)

Friday, July 02, 2010
8:00 AM

$$R(n)=\begin{cases} 3 \to 1 & n=0 \\ 14 \to k & n=1 \\ 12\,R(n-1)-20\,R(n-2) & n>1 \end{cases}$$

Find two numbers that sum to 12 & multiply to 20.

$$k^2 = 12k - 20 \quad \Rightarrow \quad k = 2 \text{ or } k = 10$$

That means 10^n & 2^n are closed rules that work with the proper starting numbers.

How to get access to the CME textbooks that Bowen is working on
http://www.pearsonsuccessnet.com
Username: PCMI2010
Password: cme2010

Coolest decimal expansion ever.

Friday, July 02, 2010
10:20 AM

$$S = 0.001001002003005008013\ldots$$

$$1000S = 1.001002003005008\ldots$$

$$999S = 1.000001001002\ldots = 1 + \frac{S}{1000}$$

$$S = \frac{1000}{998999}$$

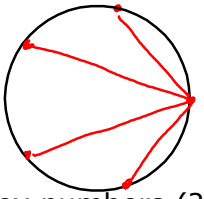
whoa!!

Recap of the first week

Friday, July 02, 2010
10:42 AM

Stuff we've learned / still intrigues us:

- How to form a closed rule for a function
- How to form a closed rule for a recursive sequence
- How to direct and guide discourse of a lesson
- Effective blackboard management
- Create a spreadsheet on a TI
- More TI-instruction and practice?
- Activities and problems geared toward grade levels?
- Why the Fibonacci sequence converges to phi (it's not magic)
- Amazing how much an explicit function and recurrence relation are related
- Appreciate looking for patterns
- Day 2--modular arithmetic (?)
- Method for finding two numbers that sum and multiply up to stuff (why does it work?)
- Patterns where it doesn't seem like it's a linear combination of two powers (alternating ?)
- Why are the closed rules always sums of two exponentials? Does it always work?
- Why is it that sometimes it's a difference of exponentials?
- How recurrence relations connect to linear algebra and mattresses?
- Circle chord problem !! Mwah ahahahahahah!!!



- Complex numbers (?)
- Linear combinations of seed numbers -- when/why does it work? What about for other types of recurrences?
- Is Marla right?? (See Day 1 tough stuff, conjecture about compositeness of numbers around Fibonacci numbers.)