

4. Does $0.999999\dots = 1$? Pick a side of this issue and defend it.
5. (a) List the first fifteen Fibonacci numbers
- (b) Remember Fibonacci Nim? [The goal is to take the last stick. You must take at least one stick but no more than two times the number taken by the previous player.] Suppose that it is your turn and there are 84 sticks left. The previous player took 5 sticks. How many do you take?
6. (a) Without referring to decimal expansions, give a definition of the *rational numbers*.
- (b) Is the quantity $3\sqrt{5}/9\sqrt{5}$ rational number? Why or why not?
- (c) Give an example of a rational number which is also a natural number.

7. Thompson-Boling Arena holds 24,535 people. It was a sell-out crowd, and the Vols won! Everyone was so happy that they decided to have a party every day for the next year. They decided that each person would attend the party which occurred on his or her own birthday. Show that at least one of these parties will have at least 50 people.

8. You are at the river with a three quart bucket and a five quart bucket. Neither has any markings or lines on them that could be used for measurement. How would you bring back exactly four quarts of water?

9. (a) Who were the Pythagoreans?

(b) What bothered them about $\sqrt{2}$?

[Bonus: 2 points] True or false: If the number n^2 is evenly divisible by 4, then the number n must always be evenly divisible by 4. Either explain why this must be true or else give a counterexample.

[Bonus: 1 point] What are some of the “Life Lessons” that we hope you learn in this course?