Fibonacci Numbers

Activity

- Introduce Fibonacci Numbers

- Introduce some examples of where Fibonacci Numbers appear in nature etc.

- Have students work through the Fibonacci and Rabbits handout

Assignments

In class today, we saw that sunflower heads and pinecones show Fibonacci numbers of spirals. But we didn't explain WHY Fibonacci numbers appear in the plant structures like these. The goal of this assignment is to get you to think more deeply about this amazing connection between numbers and nature.

1. Read this online article for the best current explanation of WHY Fibonacci numbers appear so frequently in plant structures: Julie Rehmeyer, "The Mathematical Lives of Plants", Science News, May 3, 2007 (You can also access this article online through the Cornell Library).

2. Summarize the explanation given in the article. (I expect a careful, thoughtful, concise answer here; please don't just skim the article looking for a key phrase. And please use your own words.)

3. According to the article, what are the main lines of experimental and observational EVIDENCE in support of that explanation? (Again, please use your own words.)

4. Watch these two videos by Vi Hart, a math superstar on YouTube (yes, there is such a thing!):

   Doodling in Math Class: Spirals, Fibonacci, and Being a Plant [2 of 3]
   Doodling in Math: Spirals, Fibonacci, and Being a Plant [Part 3 of 3]

5. Having watched the videos, write a few sentences explaining why some plants do NOT show exact Fibonacci numbers of spirals. Does this fact contradict the theory described in Rehmeyer's Science News article? Or support the theory? Explain.

6. Answer question 76 on p. 28 in Sec. 2.12: "Fibonacci Spirals from Optimal Packing" in Discovering the Art of Math: Number Theory

References and resources

Fibonacci Rabbits Handout

Article: The Mathematical Lives of Plants

Doodling in Math Class: Spirals, Fibonacci, and Being a Plant [2 of 3]

Doodling in Math: Spirals, Fibonacci, and Being a Plant [Part 3 of 3]

Discovering the Art of Mathematics: Number Theory