

“Mathematician”

Angelica Gonzalez
University of Arizona
Math Graduate Student

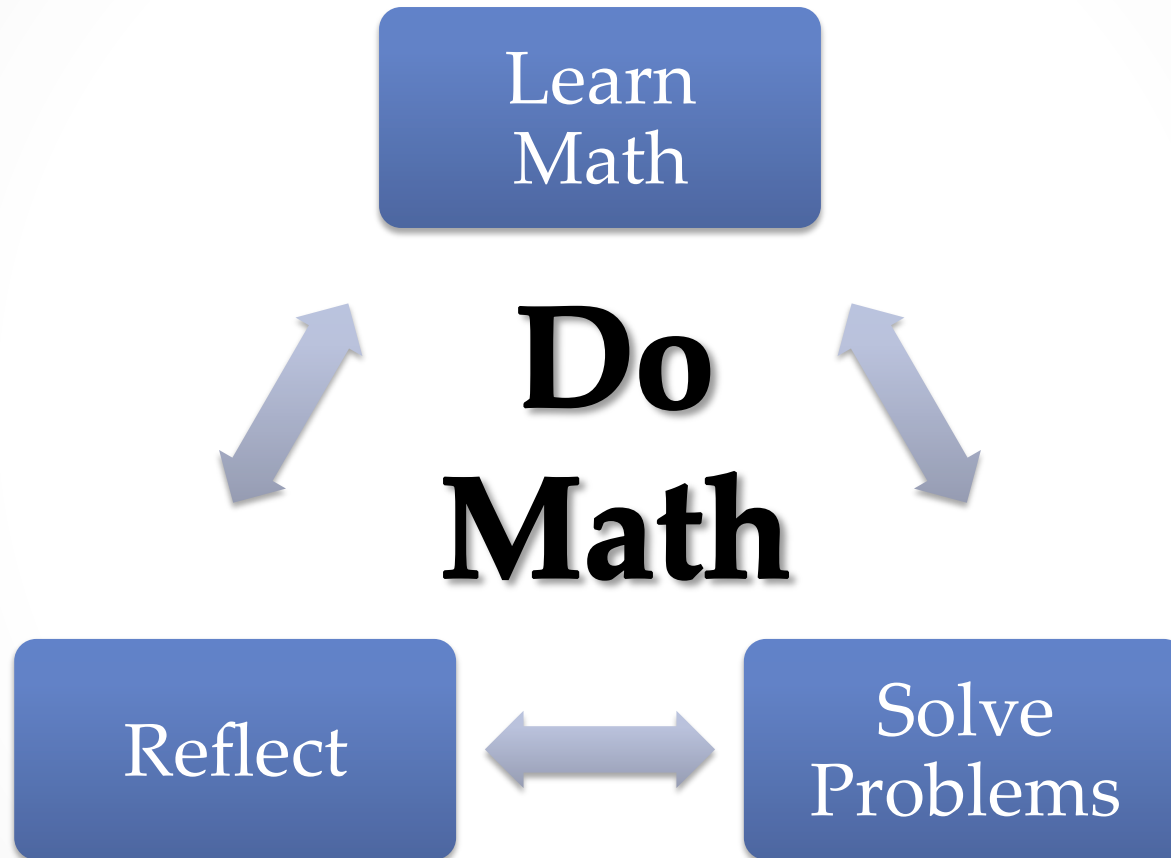


About me

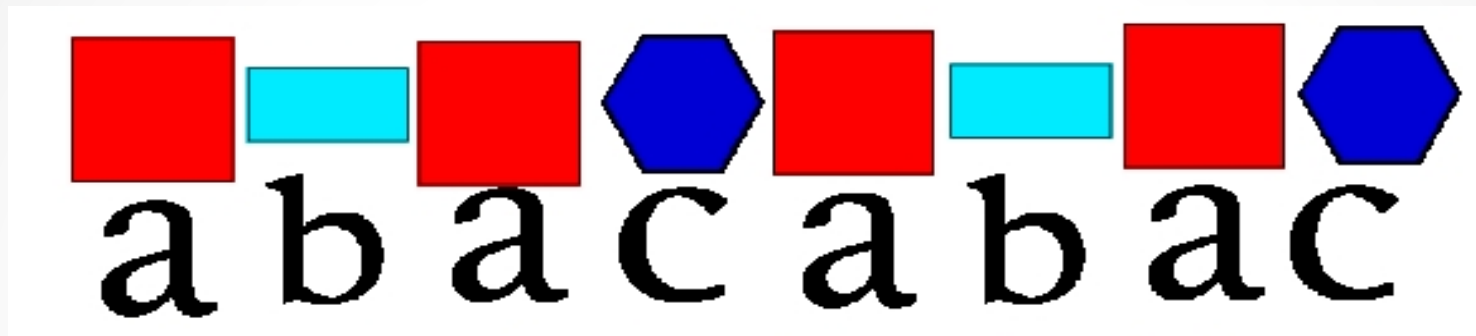
- Whittier College
- Budapest Semesters in Mathematics
- 2nd year graduate student
- Goals: Math Professor
- Fun: Hiking, salsa dancing, local music, and travel.



What do I do?

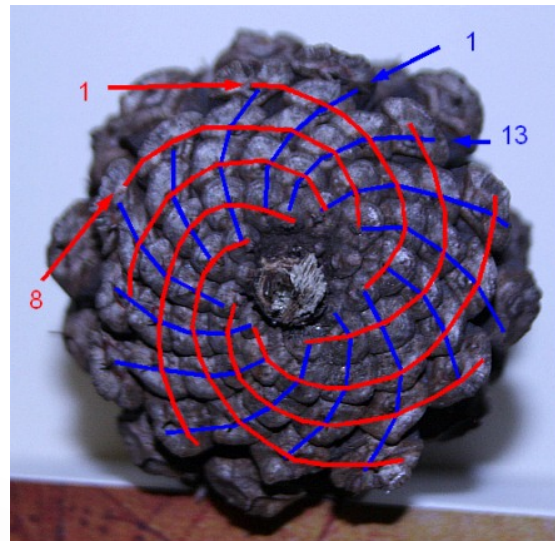
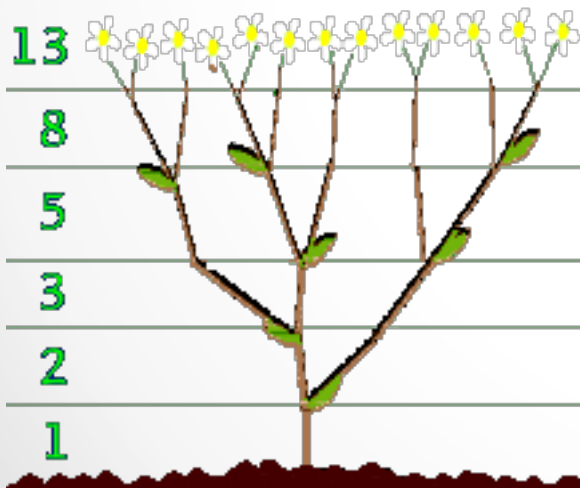


Patterns



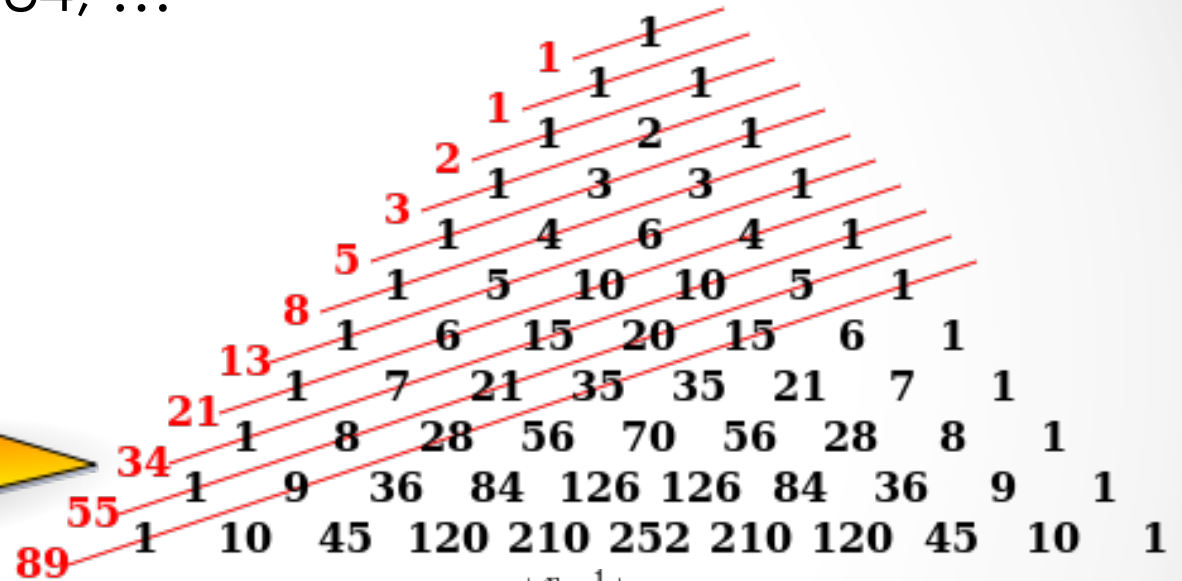
1, 1, 2, 3, 5, 8, 13, 21, ...

$F_1=1, F_2=1, F_n = F_{n-1} + F_{n-2}$ for $n \geq 3$



Fibonacci Numbers

- 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, ...



$$F_n = \sum_{k=0}^{\lfloor \frac{n-1}{2} \rfloor} \binom{n-k-1}{k}.$$

$$F_n = \frac{(1+\sqrt{5})^n - (1-\sqrt{5})^n}{2^n \cdot \sqrt{5}}$$

Sparks Curiosity

- Relationship of Fibonacci numbers and integers

m=	1	2	3	4	5	6	7	8	9	10	11	12	13
F _n	1	2	3	8	5	144	21	8	144	610	55	144	13
n=	1	3	4	6	5	12	8	6	12	15	10	12	7

- Every number is a factor of some Fibonacci number (proven in 1961 by Vorob'ev)
- Remainder after division by n (i.e. mod n)
 - Example: n=3
 - 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, ...
 - 1, 1, 2, 0, 2, 2, 1, 0, 1, 1, 2, 0, 2, 2, 1, 0, 1, 1, ...

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Research in Math

- Learn more about the structure and relationships in numbers and shapes.
- Discover new math
 - Recognize patterns
 - Develop better techniques
 - Solve unanswered problems!



Past and Future Research

- Past Research Experience
 - Relationship between Fibonacci, Sierpiński, and Riesel numbers (Mellon Mays Undergraduate Fellowship)
 - Directed Strongly Regular Graphs (Iowa State REU)
- Future Research Goals
 - Explore Analysis

