Organizational Notes

1. A Zoom recording link and class notes will be sent out after each class.

2. Remember to send your answers to the classroom worksheets. Title your email with enough to help me record your “participation”.

Review

1. What is a bracketing of a string of $n + 1$ $x$’s?

2. Another way to count the number of ballot sequences with length $2n$ is to show that they satisfy the same recursive formula as the Catalan numbers, with the same initial terms (“initial conditions”).

Parenthesization/Bracketing

1. Find all bracketings of strings of 5 $x$’s ($n = 4$ left parentheses, and $n = 4$ right parentheses).

2. Can you conjecture the number of bracketings of strings with $n + 1$ $x$’s?

3. How can you prove this conjecture?

Dyck Paths

4. What is a Dyck path?

5. How many Dyck paths are there with 2 steps?

6. How many Dyck paths are there with 3 steps?
7. How many Dyck paths are there with 4 steps?

8. How many Dyck paths are there with 5 steps?

9. Can you conjecture the number of Dyck paths with \( n \) steps?

10. How can you \textit{prove} this conjecture?