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. We will prove that $C_n = \frac{1}{n+1} \binom{2n}{n}$.

2. We proved the formula:

$$C(x) = -\frac{1}{2} \sum_{n \geq 0} \left( \frac{1}{2} \right)^{n+1} (-4)^n x^n.$$

The Explicit Formula (Sec. 1.3, 1.4)

1. What does our formula for $C(x)$ imply?

2. How can we get from here to the cleaner, more attractive, formula in the claim?
Binary Trees (Sec. 1.5)

3. What is a binary tree?

4. How many binary trees are there with 2 nodes?

5. How many binary trees are there with 3 nodes?

6. How many binary trees are there with 4 nodes?

7. Can you conjecture how many binary trees there are with $n$ nodes?

8. Can you prove your formula?

9. What is a bijective proof?

10. What is a bijection?

11. Show that $\binom{n}{k} = \binom{n}{n-k}$. 