Problem Set 1

September 9, 2024

Problem 1. Prove that, for any integer $n \geq 1$,

$$1^3 + 2^3 + \cdots + n^3 = \frac{n^2(n+1)^2}{4}.$$

Problem 2. Prove that, for any integer $n \geq 1$,

$$\binom{n}{0} + \binom{n}{1} + \cdots + \binom{n}{n-1} + \binom{n}{n} = 2^n.$$