

CSE 390Z: Mathematics for Computation Workshop

QuickCheck: Induction Proof (due Monday, February 13)

Please submit a response to the following questions on Gradescope. We do not grade on accuracy, so please submit your best attempt. You may either typeset your responses or hand-write them. Note that hand-written solutions must be legible to be graded.

We have created [this template](#) if you choose to typeset with Latex. [This guide](#) has specific information about scanning and uploading pdf files to Gradescope.

0. Induction Junction, what's your function?

The sum of integers up to n can be represented as $0 + 1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$, where $n \in \mathbb{N}$ (this fact can actually be proven using induction).

Prove the following equality for all $n \in \mathbb{N}$

$$(0 + 1 + 2 + \dots + n)^2 = 1^3 + 2^3 + \dots + n^3$$

Hint: If the sum of integers up to n equals $\frac{n(n+1)}{2}$, then how would you represent the sum of integers up to n , squared? What about the sum of integers up to $n + 1$?

1. Video Solution

Watch [this video](#) by 390z TA Timothy on the solution **after** making an initial attempt. Then, answer the following questions.

- (a) What is one thing you took away from the video solution?
- (b) What topic from the quick check or lecture would you most like to review in workshop?