

CSC165 fall 2019

Mathematical expression:
induction

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BA4270 (behind elevators)

Web page:

<http://www.teach.cs.toronto.edu/~heap/165/F19/>

Using Course notes: Induction

Outline

induction format

- ▶ predicate
- ▶ base case
- ▶ inductive step

prove $\forall n \in \mathbb{N}, 7^n \equiv 1 \pmod{6}$

discover, then prove sum of first n numbers result

discover, prove sum of first n cubes result

modular addition for more than pairs

review induction parts

- ▶ claim
- ▶ base case
- ▶ inductive step

more domino logistics....

$$7^0 \equiv 1 \pmod{6}$$

$$7^1 \equiv 1 \pmod{6}$$

$$7^2 \equiv 1 \pmod{6}$$

$$7^3 \equiv 1 \pmod{6}$$

$$7^4 \equiv 1 \pmod{6}$$

$$7^5 \equiv 1 \pmod{6}$$

... “etc.”

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... “etc.”

$$2n + 1 < 2^n$$

$$\forall n \in \mathbb{N}, 3^n \geq n^3$$

$$\forall x, y \in \mathbb{N}, \forall n \in \mathbb{N}, x - y \mid x^n - y^n$$

order of introductions...

every set with n elements has 2^n subsets

more order of introductions...