
Math 215

Please box your answers for each of the exercises below. Also, be mindful of your presentation, I will deduct 10 points for disorganized or unintelligible answers.

Exercises

- 1) Let $y_1 = 6$, and $\forall n \in \mathbb{N}$, $y_{n+1} := \frac{2y_n - 6}{3}$.
 - Use induction to prove that $\forall n \in \mathbb{N}$, $y_n > -6$.
 - Use another induction argument to show that $\forall n \in \mathbb{N}$, $y_{n+1} \leq y_n$.

- 2) Give an example of each or state that the request is impossible:
 - $f : \mathbb{N} \rightarrow \mathbb{N}$ that is 1-1 but not onto.
 - $f : \mathbb{N} \rightarrow \mathbb{N}$ that is onto but not 1-1.
 - $f : \mathbb{N} \rightarrow \mathbb{Z}$ that is 1-1 and onto.

- 3) Section 2.1: Problem 8.

- 4) Section 2.1: Problem 9.

- 5) Section 2.1: Problem 20.

- 6) Section 2.1: Problem 22.

- 7) Section 2.2: Problem 3.

- 8) Section 2.2: Problem 4.

- 9) Section 2.2: Problem 5.

- 10) Section 2.2: Problem 11.