CSE 015: Discrete Mathematics
Fall 2019
Homework #4
Andre Martin
Due 5:00 pm Friday, November 15 via CatCourses

1. **Question 1:**

   (a) Domain: $\{0, 1, 2, 3, ...\} = \mathbb{N}$, Range: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

   (b) Domain: $\{1, 2, 3, ...\} = \mathbb{N} - \{0\}$, Range: $\{2, 3, ...\} = \mathbb{N} - \{0, 1\}$

   (c) Domain: $\{\lambda, 0, 1, 00, 01, 10, 11, 000, 001, 010, 011, ...\}$, Range: $\{0, 1, 2, 3, ...\} = \mathbb{N}$

   (d) Domain: $\{\lambda, 0, 1, 00, 01, 10, 11, 000, 001, 010, 011, ...\}$, Range: $\{1, 2, 3, ...\} = \mathbb{N}$

2. **Question 2:**

   (a) onto

   (b) not onto

   (c) onto

   (d) onto

   (e) not onto

3. **Question 3:**

   (a) all functions are one to one unless someone shares a phone number with someone else

   (b) all functions are one to one, everyone has different student identification numbers

   (c) functions are one to one if everyone has a different final grade

   (d) functions are one to one if everyone is from a different home town

4. **Question 4:**

   (a) yes

   (b) no

   (c) no

   (d) yes