2018年8月19日 星期日

Discrete Math 2018

problem set 7

1. Explain properties following axiomatic set theory.
   A. Union
   B. Existence
   C. Specification
   D. Infinity
2. Let A= $\{1, 2\}$, B=$\{3, 4\}$
   A. A×B=?
   B. Power set of A×B
3. f : N → N. f(x)=x^2 .
   A. Is f surjective ?
   B. Is f injective ?
   C. Is f bijective ?
   D. What is the range of f ?
4. f : N → N. f(x)=$x + 1$.
   A. Is f surjective ?
   B. Is f injective ?
   C. Is f bijective?
   D. What is the range of f ?
5. f : Z → Z. f(x)=$x + 1$.
   A. Is f surjective ?
   B. Is f injective ?
   C. Is f bijective?
   D. What is the range of f ?
6. We can classify functions f : A → B based on how many elements x of the domain A get mapped to each element y of the codomain B. State the condition of classifying the following function.
   A. A function is surjective.
   B. A function is injective.
   C. A function is bijective.

7. $A = \{2x \mid x \in N\}. B = \{2x + 1 \mid x \in N\}$. Let | A | denote the cardinality of A.
   A. $|A| = ?$
   B. $|A \cup B| = ?$
8. $f : R \to R$ and $g : R \to R$. f(x)=x+1, g(x)=x^2. $(f \circ g)(x) = ?$