Problem 1. Can the domain of a function be equal to the range?
   A) Yes   B) No

Problem 2. Suppose f is a function. What kind of object is f^{-1}? (It is possible for f^{-1} to be all of the below, but only some of them are guaranteed to happen for any function f.)
   A) a relation   B) a function   C) a set   D) all of the above   E) A) and C) only

Problem 3. Is the function $f(x) = x + 1$ onto?
   A) Yes   B) No   C) Onto what?

Problem 4. Let P be the set of living people and let N be the set of names. Let $f : P \to N$ be the function

$$f(x) = x\text{'s name.}$$

Which of the following are true?

   A) f is one-to-one (injective).

   B) f is onto (surjective).

   C) f is both one-to-one and onto (bijective).

   D) None of the above.

Problem 5. Let P be the set of people and D the set of days of the year. Define $f : P \to D$ to be the function

$$f(x) = x\text{'s birthday.}$$

Which of the following are true?

   A) f is one-to-one (injective).

   B) f is onto (surjective).

   C) f is both one-to-one and onto (bijective).

   D) None of the above.

Problem 6. Let A be the set of citizens of the United States and let S be the set of social security numbers. Define $f : A \to S$ to be the function

$$f(x) = x\text{'s social security number.}$$

Which of the following are true?

   A) f is one-to-one (injective).

   B) f is onto (surjective).

   C) f is both one-to-one and onto (bijective).

   D) None of the above.

Problem 7. Which of the following apply to $\varnothing : \varnothing \to \varnothing$.

   A) It is one-to-one (injective).

   B) It is onto (surjective).

   C) It is both one-to-one and onto (bijective).

   D) None of the above.

Problem 8. If $f : A \to B$ is one-to-one then $|B| \geq |A|$.
   A) True   B) False

Problem 9. Every function surjects onto its range.
   A) True   B) False

Problem 10. If $f : A \to B$ is onto then $|B| \geq |A|$.
   A) True   B) False

Problem 11. Let A and B be finite sets. How many functions are there from A to B?
   A) $|A| + |B|$ B) $|A| \times |B|$ C) $|B|^{|A|}$ D) $|A|^{|B|}$ E) None of these