MAT320 Quiz #2

9/12/2023

Please answer the following questions.

Question 1. Let $f : X \to Y$ be a function. Is it always true that $f(f^{-1}(A)) = A$ for any $A \subset Y$, no matter what kind of function f is?
(Answer True/False.)

Question 2. Please state if the following functions are bijective, injective, surjective, or neither.

a) $f : \mathbb{R} \to \mathbb{R}, f(x) = x^2$

b) $f : \mathbb{R} \to \mathbb{R}, f(x) = x^3$.

Question 3. A relation is a subset $E \subset X \times X$. An equivalence relation on a set X is a type of relation satisfying certain axioms. Given $x \in X, y \in X$, we write $x \sim_E y$ if $(x, y) \in E$.

a) Write the axioms of an equivalence relation.

b) Give an example of an equivalence relation.

c) Give an example of a relation that is not an equivalence relation (explain why).