

Quiz: September 3

This is a closed-book quiz, and no team-work or reference materials are permitted.

Give a mathematically precise definition of an equivalence relation, including defining any key technical terms used. Be sure to include any context needed for your definition to make sense.

[Example of needed context: If you are trying to define “relation,” be sure to indicate the sets that your relation will try to relate. Example of a complete definition of relation: “A relation from set A to set B is any subset of $A \times B$, where $A \times B = \{(m, n) \mid m \in A \text{ and } n \in B\}$ ”]

Solution

An equivalence relation is a relation r on a set A that has the following 3 properties

- (a) Reflexive: For all $x \in A$, $x r x$.
- (b) Symmetric: For all $x, y \in A$, if $x r y$ then $y r x$.
- (c) Transitive: For all $x, y, z \in A$, if $x r y$ and $y r z$, then $x r z$.

Grading: Total points possible = 5.

2 points for correct words in defn. of equivalence relation.

0.5 pt each for: relation on a set; reflexive; symmetric; transitive.

1 point each for correct defns. of reflexive, symmetric, transitive.