

Q1) Determine whether the following relations are reflexive , transitive and symmetric...

- a) has a common factor greater than 1
- b) is a brother of
- c) is in a blood relationship with

Q2) Define a relation on \mathbb{Z} by xRy iff $x+2y$ is divisible by 3. Is this an equivalence relation . Prove or disprove.

Q3) Consider the following relation R on the set $\mathbb{N} \times \mathbb{N}$, where \mathbb{N} is the set on natural numbers.

$(m_1; n_1) R (m_2; n_2)$ iff $m_1 + n_2 = m_2 + n_1$:

Prove that it is an equivalence and find the equivalence classes.

Q4) Consider a graph of 4 vertices (A,B,C,D)

Edges---

A→B

B↔C

C↔A

C→D

D↔B

Find all possible two step paths such that a vertex loops on itself.(At the end of the 2nd step it returns to where it started from)

Q5) Let S be the set of integers from 1 to 50. Define a relation xRy if the product of digits in x is equal to the product of digits in y . Is this an equivalence relation . If yes , find the equivalence classes (:P).

Q6) In the graph below find by warshall's technique that is there a path between vertex 5 and 4.

