

3. a) Express the definition of an injective function formally in terms of ordered pairs.

b) Express the definition of an even function formally in terms of ordered pairs.

4. Let S be a set and \mathcal{P} a partition of S .
- a) The relation on S defined by $a \sim b$ iff $\exists P \in \mathcal{P}$ for which $a, b \in P$ is a reflexive relation.

b) The relation on S defined by $a \sim b$ iff $\exists P \in \mathcal{P}$ for which $a, b \in P$ is a symmetric relation.

c) The relation on S defined by $a \sim b$ iff $\exists P \in \mathcal{P}$ for which $a, b \in P$ is a transitive relation.

5. Say that two vertices v_1 and v_2 of a graph G are **propinquous** iff there exists a walk between them that contains exactly one vertex other than v_1 and v_2 .

a) Is the relation of being propinquous reflexive?

b) Is the relation of being propinquous symmetric?

c) Is the relation of being propinquous transitive?