Name   :

Student ID :   Section   :

Date   :

Marks

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1. Let R_1 be a relation on $\mathbf{A} = \{4, 6, 8\}$ defined by $R_1 = \{(a, b) \mid a \in \mathbf{A}, b \in \mathbf{A}, a > b\}$.

    a. Find R_1.

    b. List the domain and range of R_1.

    c. Determine whether the relation is irreflexive. Justify your answer.

2. Suppose that the matrix of relation R_2 on $\{a, b, c, d\}$ is,

$$\begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

    relative to the ordering a, b, c, d.

    a. Construct the digraph of R_2, and list in-degrees and out-degrees of all vertices.

    b. Is R_2 an equivalence relation? Justify your answer.