Discrete Math, Semester 2019-2020-1, Quiz 3

Student ID:_____ Name:_____

2019/11/21

1. List the ordered pairs, and then draw the directed graph of the relation corresponding to the matrix. (2 points)

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

2. Determine the property of the relation given in the Question 1. (1 points)

3. Find the smallest relation containing the above relation that is reflexive, symmetric, and transitive. (3 points)

4. Let R be the relation on the set of ordered pairs of positive integers such that $((a, b), (c, d)) \in R$ if and only if $a + d = b + c$.
a) Show that R is an equivalence relation. (1 point)

b) What's the equivalence class of (3, 4) with respect to the equivalence relation. (1 point)

5. Draw the Hasse diagram for the divisibility on the set {1,2,5,10,11,15,20}. Then determine whether the poset is lattice. (2 points)