Homework 2 2015 / 2016



## Show all your work

Q1: List the ordered pairs in the relation R from A = {0, 1, 2, 3, 4} to B = {0, 1, 2, 3}, where (a, b) ∈ R if and only if a) a + b = 4. b) a > b

 $\begin{array}{l} Q2: Let \\ R_1 = \{\!(1,\,2),\,(2,\,3),\,(3,\,4)\!\} \text{ and } R_2 = \{\!(1,\,1),\,(1,\,2),\,(2,\,1),\,(2,\,2),\,(2,\,3),\,(3,\,1),\,(3,\,2),\,(3,\,3),\,(3,\,4)\!\} \\ \text{be relations from } \{1,\,2,\,3\} \ \text{to} \ \{1,\,2,\,3,\,4\}. \ \text{Find} \\ a) \ R_1 \ \cup \ R_2. \qquad b) \ R_1 \ \cap \ R_2. \qquad c) \ R_1 - R_2. \end{array}$ 

Q3 : Represent each of these relations on {1, 2, 3} with a matrix a) {(1, 1), (1, 2), (1, 3)} b) {(1, 1), (1, 2), (1, 3), (2, 2), (2, 3), (3, 3)}

Q4 : list the ordered pairs in the relations represented by the directed graphs.



Q5: Let R be the relation represented by the matrix

 $\mathbf{M}_R = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}.$ 

Find the matrices that represent  $\mathbb{R}^2$ .