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Tugas Struktur Diskrit I - Relasi & Fungsi

1) $A = \{0,1,2,3,4\}$, $B = \{0,1,2,3\}$

Relasi R dari A ke B dengan $(a,b) \in R$ jika dan hanya jika $a > b$,

maka $R = \{(1,0), (2,0), (2,1), (3,0), (3,1), (3,2), (4,0), (4,1), (4,2), (4,3)\}$

2) Relasi R pada $\{1,2,3,4\}$ yang didefinisikan oleh $(x,y) \in R$ jika $x^2 \geq y$

maka $R = \{(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)\}$

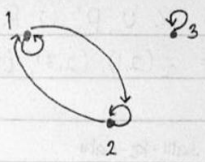
3). Relasi $R = \{(1,2), (2,1), (3,3), (1,1), (2,2)\}$ pada $X = \{1,2,3\}$

Tabel :

X_x	X_y
1	2
2	1
3	3
1	1
2	2

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

Graf Berarah :



4) a. tak-setangkup, menghantar

b. Setangkup

c. refleksif, setangkup, menghantar

d. tak-setangkup.

6) $R = \{(1,2), (1,3), (2,3), (2,4), (3,1)\}$

$S = \{(2,1), (3,1), (3,2), (4,2)\}$

$S \circ R = \{(1,1), (1,2), (2,1), (2,2)\}$ //

$R \circ S = \{(2,2), (2,3), (3,2), (3,3), (3,4), (4,3), (4,4)\}$

9) $A = \{1,2,3\}$

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

Elemen yang bernilai 1 : $M_{11}, M_{31}, M_{22}, M_{13}, M_{33}$

pasangan terurut relasi berdasarkan matriks

$R = \{(1,1), (1,3), (2,2), (3,1), (3,3)\}$

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

Elemen yang bernilai 1 : M_{12}, M_{22}, M_{32}

Pasangan terurut relasi berdasarkan matriks

$R = \{(2,1), (2,2), (2,3)\}$.

(KKY)

14) $A = \{1,2,3,4\}$

$R = \{(1,1), (2,3), (4,4), (2,1)\}$ $\rightarrow$ $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

a) $R^{-1} = R^T = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

b) $\bar{R} = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix}$

c) $R^2 = R \circ R = \{(1,1), (2,1), (4,4)\}$, $R^2 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

d) $R^3 = R^2 \circ R = \{(1,1), (2,1), (4,4)\}$, $R^3 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

18) $R = \{(2,1), (2,3), (3,1), (3,4), (4,1), (4,3)\}$

$R^2 = R \circ R = \{(2,1), (2,4), (3,1), (3,3), (4,1), (4,4)\}$

$R^3 = R^2 \circ R = \{(2,1), (2,3), (3,1), (3,4), (4,1), (4,3)\}$

$R^4 = R^3 \circ R = \{(2,1), (2,4), (3,1), (3,3), (4,1), (4,4)\}$

Klosur menghasilkan dari R

$R^* = R \cup R^2 \cup R^3 \cup R^4$

$= \{(2,1), (2,3), (2,4), (3,1), (3,3), (3,4), (4,1), (4,3), (4,4)\}$.

27) a. Fungsi satu-ke-satu

b. Fungsi satu-ke-satu

c. Bukan fungsi satu-ke-satu

30) $f = \{(a,x), (b,x), (c,z), (d,w)\}$

$g = \{(1,b), (2,c), (3,a)\}$

$f \circ g = \{(1,x), (2,z), (3,x)\}$ //

KIKY