Nandastra Adi D
17/410481/TK/45838

① A = { Joko, Suranto, Imar, Tira }
B = { nasi goreng, sate, martabak, bakso, mie ayam, pecel }
A × B = {(Joko, nasi goreng), (Joko, sate), (Joko, martabak), (Joko, bakso), (Joko, mie ayam), (Joko, pecel), (Suranto, nasigoreng), (Suranto, sate), (Suranto, martabak), (Suranto, bakso), (Suranto, mie ayam), (Suranto, pecel), (Imar, nasigoreng), (Imar, sate), (Imar, martabak), (Imar, bakso), (Imar, mie ayam), (Imar, pecel), (Tira, nasigoreng), (Tira, sate), (Tira, martabak), (Tira, bakso), (Tira, mie ayam), (Tira, pecel)}

~~Relasinya~~ R adalah relasi yang menyatakan makanan favorit himpunan A

② A R B = { (Joko, pecel), (Suranto, sate), (Susanto, martabak), (Imar, martabak), (Imar, mie ayam), (Tira, nasi goreng), (Tira, martabak), (Tira, bakso), (Tira, pecel)}.

Reprecentasi Relasi dengan Matriks

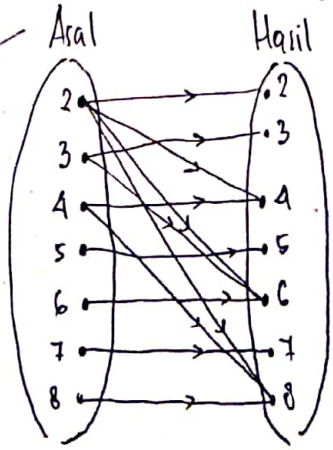
$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 1 & & 1 & 1 & & 1 \end{bmatrix}$$

③ A = { Cristiano Ronaldo, Lionel Messi, Paulo Dybala, ~~Eto~~ Ibrahimovic, Mbappe }.
B = { PSG, Juventus, Barcelona, AC Milan }
(A, B) ∈ f = {(Cristiano Ronaldo, Juventus), (Lionel Messi, Barcelona), (Paulo Dybala, Juventus), (Ibrahimovic, AC Milan), (Mbappe, PSG)}.
Ini merupakan fungsi karena semua himpunan A dihubungkan tepat 1 elemen di dalam B.

④ S = { 2, 3, 4, 5, 6, 7, 8 }
R = { (2,2), (2,4), (2,6), (2,8), (3,3), (3,6), ~~(4,8)~~, ~~(5,5)~~ (4,4), (4,8), (5,5), (6,6), (7,7), (8,8) }

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

Reflektif

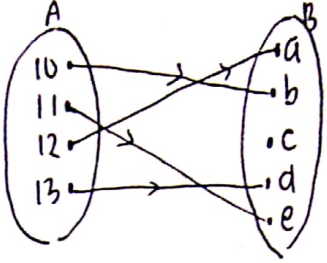


⑤ a) Fungsi Injektif (one to one)

$A = \{10, 11, 12, 13\}$

$B = \{a, b, c, d, e\}$.

$f = \{(10, b), (11, e), (12, a), (13, d)\}$

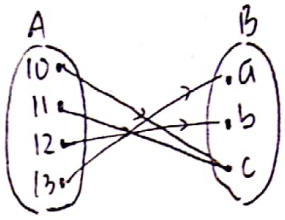


b) Fungsi Surjektif

$A = \{10, 11, 12, 13\}$

$B = \{a, b, c\}$.

$f = \{(10, c), (11, c), (12, b), (13, a)\}$

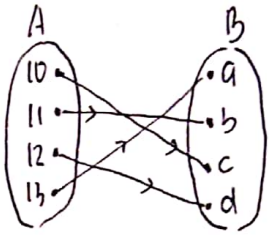


c) Fungsi Bijektif

$A = \{10, 11, 12, 13\}$

$B = \{a, b, c, d\}$.

$f = \{(10, c), (11, b), (12, d), (13, a)\}$

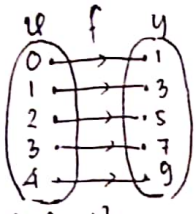


⑥ a) Fungsi Invers

$f(x) = 2x + 1$

$x = \{0, 1, 2, 3, 4\}$

$y = \{1, 3, 5, 7, 9\}$.



$f = \{(0,1), (1,3), (2,5), (3,7), (4,9)\}$.

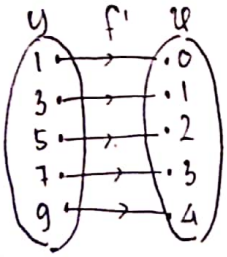
Inversnya:

$y = 2x + 1$

$2x = y - 1$

$x = \frac{y-1}{2}$

$f^{-1}(y) = \frac{y-1}{2}$



$y = \{1, 3, 5, 7, 9\}$

$x = \{0, 1, 2, 3, 4\}$

$f^{-1} = \{(1,0), (3,1), (5,2), (7,3), (9,4)\}$.

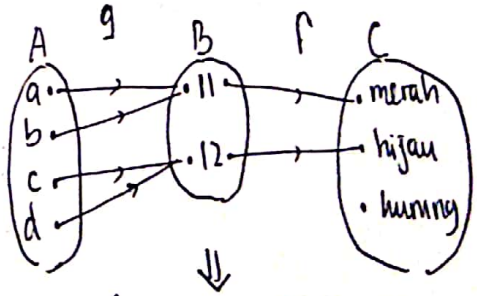
b) ~~g =~~ $A = \{a, b, c, d\}$

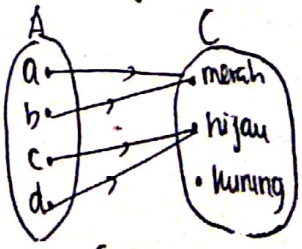
$B = \{11, 12\}$

$C = \{\text{merah}, \text{hijau}, \text{kuning}\}$

$A \; R \; B = g = \{(a, 11), (b, 11), (c, 12), (d, 12)\}$.

$B \; R \; C = f = \{(11, \text{merah}), (12, \text{hijau})\}$.





$f \circ g = \{(a, \text{merah}), (b, \text{merah}), (c, \text{hijau}), (d, \text{hijau})\}$