

Relation & function

31 Reflexive Relation :- $\forall a \in A [(a, a) \in R]$ For every $a \in A$

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

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

So:-
 $\begin{matrix} 1 & 2 & 3 \\ \downarrow & \downarrow & \downarrow \\ a & a & a \end{matrix} \rightarrow a \in A \rightarrow (1, 1) \in R \checkmark$
 $\rightarrow a \in A \rightarrow (2, 2) \in R \checkmark$
 $\rightarrow a \in A \rightarrow (3, 3) \in R \checkmark$

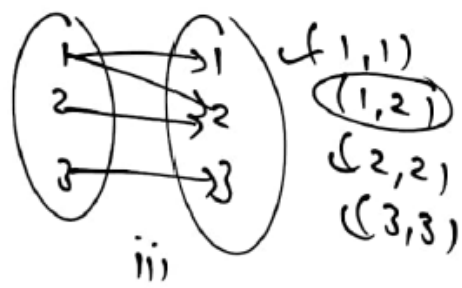
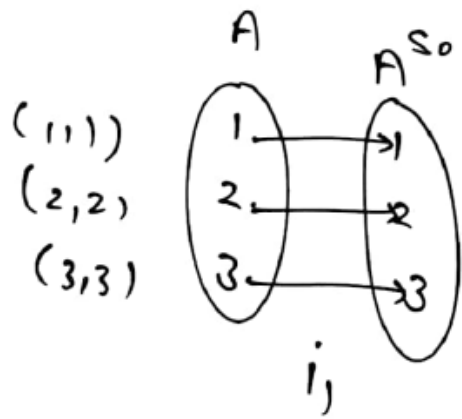
$R_i = \{(1, 1), (2, 2), (3, 3)\}$

\Downarrow
 Reflexive Relation

Identity Relation

$\forall a$ only $(a, a) \in R$ For: $a \in A$

So here it is reflexive Relation.



Relation & function

3) Reflexive Relation :-

Ex: $A = \{1, 2, 3\}$ then

$R_1 = \{(x, y) \mid y > x\}$ \rightarrow is it reflexive? ✓

Solⁿ:- $A = \{1, 2, 3\}$

$\therefore R_1 = \{(1, 1) (1, 2) (1, 3) (2, 2) (2, 3) (3, 3)\}$

Here:- $\{(1, 1) (2, 2) (3, 3) \in R_1\}$

$(a, a) \in R$ for $(a \in A)$ so it is reflexive.

Ex:- $A = \{2, 3\}$

$R = \{(x, y) \mid y > x^2\}$

Solⁿ:- $R = \{(2, 4) (3, 9)\}$

✓

Identity Relation:-

$R_1 = \{(x, y) \mid y = x\}$

$R_2 = \{(1, 1) (2, 2) (3, 3)\}$

if $(a, b) \in R$

↓

then $(b, a) \in R$

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