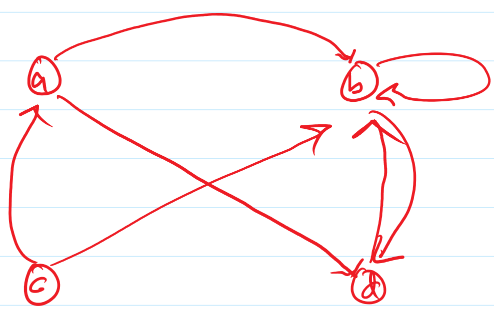
Lecture 16:- REPRESENTING RELATIONS.

GRAPHS:- Vertices O } Syntax.
Edges / Arcs. →

Set of Vertices. } Symantics.
set of Edges.

Ex7:- 479.
Set of Vertices = {a, b, c, d}.
" " " = {(a,b), (a,d), (b,b), (b,d), (c,a), (c,b), (d,b)}.



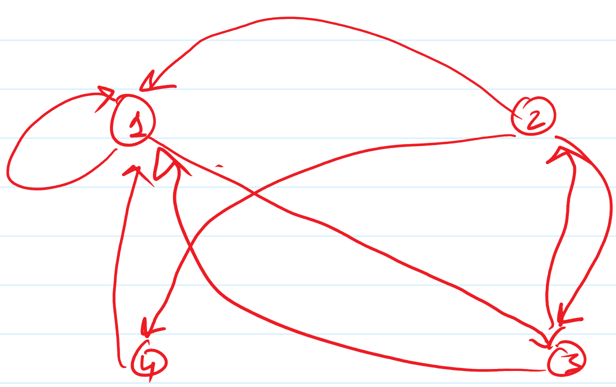
REPRESENTING RELATIONS USING GRAPHS

Ex8:- 480
Set of Vertices = SET ON WHICH RELATION Defined.
V = A

Set of Edges = R.

R = {(1,1), (1,3), (2,1), (2,3), (2,4), (3,1), (3,2), (4,1)}.

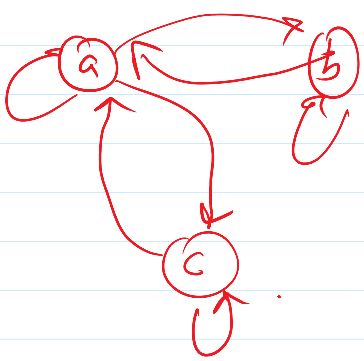
A = {1, 2, 3, 4}.



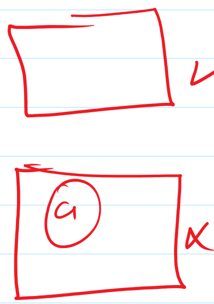
→ 3 Equivalent forms of Relations.

→ Relation in Set
→ " " Matrix.
→ " " Graph.

REFLEXIVE. $\forall a \in A \quad (a,a) \in R$.



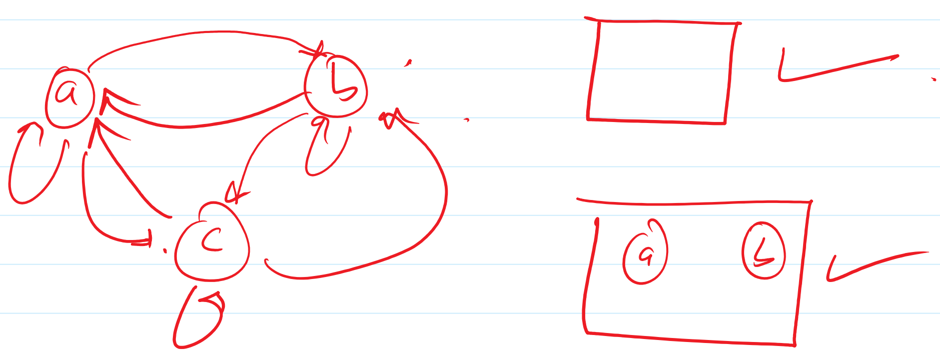
$A = \{a, b\}$.



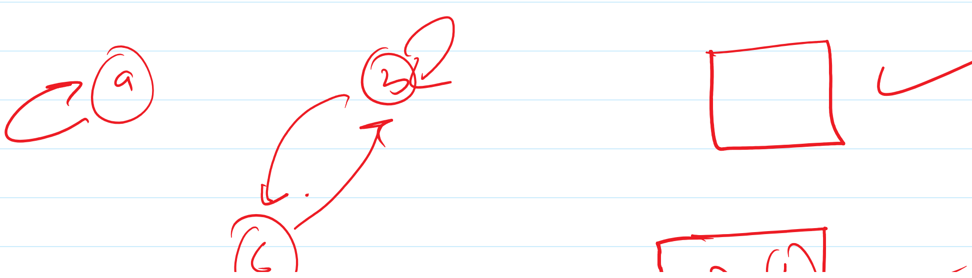
$A = \{\ \}$.

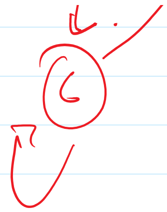
$A = \{a\}$.

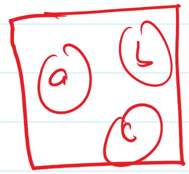
Symmetric: $\forall a,b \in A \quad (a,b) \in R \rightarrow (b,a) \in R$.



Anti Symmetric. $\forall a,b \in A$ if $(a,b) \in R \wedge (b,a) \in R \rightarrow a = b$.







Transitive :- $\forall a, b, c \in A$ if $(a,b) \in R \wedge (b,c) \in R \rightarrow (a,c) \in R$.