



TOPIC:2- Posets

Poset:

A set  $P$  together with a partial ordering  $R$  is called a partially ordered set (or) a poset.

Eg:  $\mathbb{N}$  is a partially ordered set with partial ordering on  $\mathbb{N}$ . Then the ordered pair  $(\mathbb{N}, \leq)$  is called a partially ordered set (or) a poset.

Note:

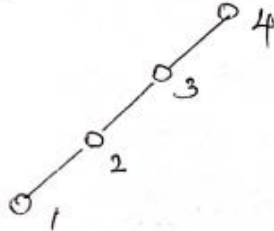
<u>Poset</u>	<u>Relation</u>
$(\mathbb{Z}^+,  )$	divides
$(\mathbb{R}, \leq)$	less than (or) equal to
$(\mathbb{R}, \geq)$	Greater than (or) equal to
$(\mathcal{P}(A), \subseteq)$	set inclusion.

Hasse diagram (or) partially ordered set diagram.

A partial ordering  $\leq$  on a set  $P$  can be represented by means of a diagram known as a Hasse diagram (or) a partially ordered set diagram of  $(P, \leq)$ . In such a diagram, each element is represented by a small circle (or) a dot.



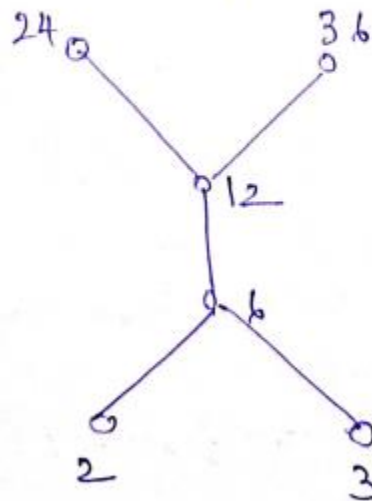
Ex Let  $P = \{1, 2, 3, 4\}$  and  $\leq$  be the relation "less than (or) equal to" then the Hasse diagram is



Let  $X = \{2, 3, 6, 12, 24, 36\}$  and the relation  $\leq$  be such that  $x \leq y$  "if  $x$  divides  $y$ ". Draw the Hasse diagram of  $(X, \leq)$ .

Solu.

The Hasse diagram is





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