

## Undirected Graph.

Total nodes = Random variables =  $M$

As the graph is undirected there could be a link between each node pair. Total number of links would be  $M \times (M-1)$ .

As this is an undirected graph each node  $M$  could be connected to any of the other nodes ( $M-1$ ).

We need distinct links, therefore consider Node X and Node Y. As it is undirected there is a link from X to Y and Y to X which is being counted twice. To get distinct links we would do  $\frac{M \times (M-1)}{2}$

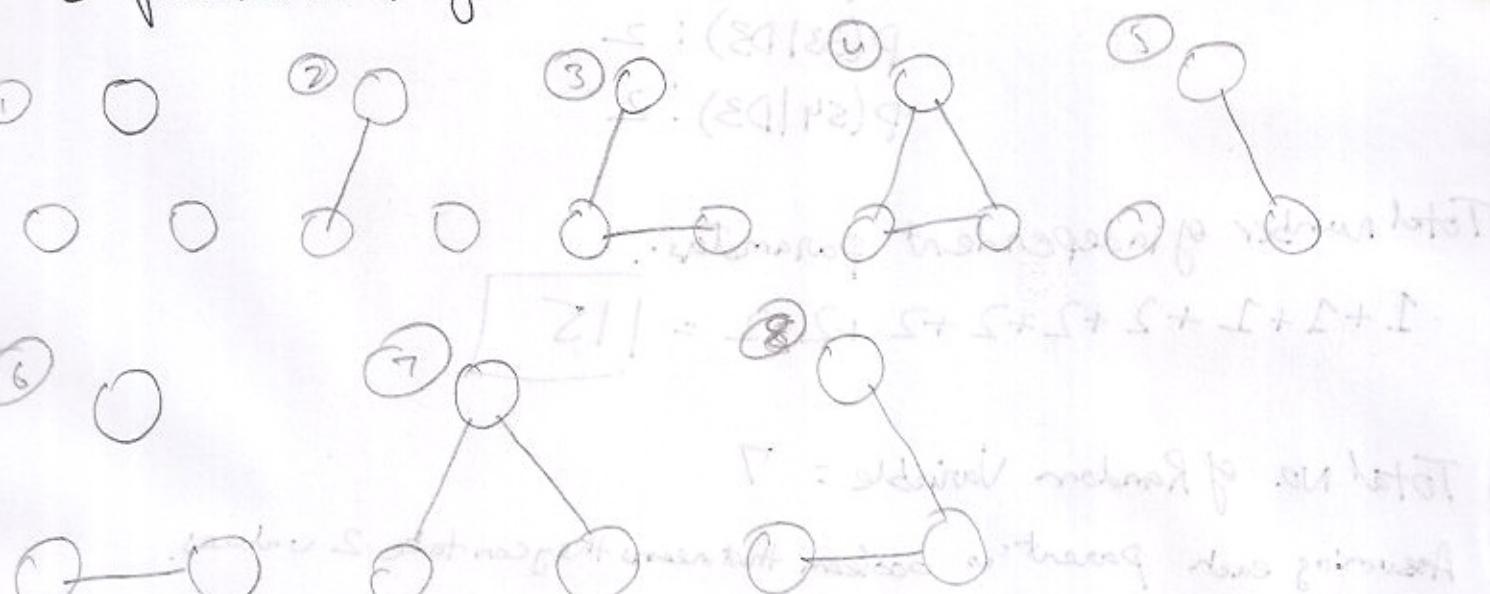
Number of distinct undirected graph would be 2 raised to the power of distinct links. that is :-

$$\frac{M \times (M-1)}{2}$$

$$\begin{aligned} S &: (12)9 \\ S &: (13)9 \\ S &: (23)9 \end{aligned}$$

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8 possibilities for  $M=3$  are :-



$$2^3 = 8$$

$\Gamma$  = edges included in subgraph (to

check if subgraph is tree or not)

$$[\text{all edges} = 2^3] \rightarrow 2^3$$

and then checking the property of tree (if  $\Gamma = 8-5 = 3$  then tree)