$\therefore$ Transitive :- $(x,y) \in R$, $(y,z) \in R$ then $(x,z) \in R$
$(1,2) \in R$; $(2,3) \notin R$ and $(1,3) \notin R$
No, It is not Transitive.

Proved!!

(7) $R \rightarrow$ Set of all the books in a library of a college.
$R = \{(x,y) : x$ and y have same no. of pages.$\}$

$\therefore$ Reflexive :- $(x,y) \in R \Rightarrow (x,x) \in R$
Here $(x,y) \in R$ and $(x,x) \in R$
It is Reflexive.

$\therefore$ Symmetric :- $(x,y) \in R \Rightarrow (y,x) \in R$
Here $(x,y) \in R$ and $(y,x) \in R$
It is Symmetric.

$\therefore$ Transitive :- $(x,y) \in R$, $(y,z) \in R$ then $(x,z) \in R$
Here all three books belongs to R.
It is Transitive

Proved!!

(8) Set $A = \{1,2,3,4,5\}$
$R = \{(a,b) : |a-b|$ is even $\}$.
$|1-2| \Rightarrow 1$ odd. $|1-5| \Rightarrow 4$ even.
$|1-3| \Rightarrow 2$ even
$\{(1,3)\ (1,5)\}$.

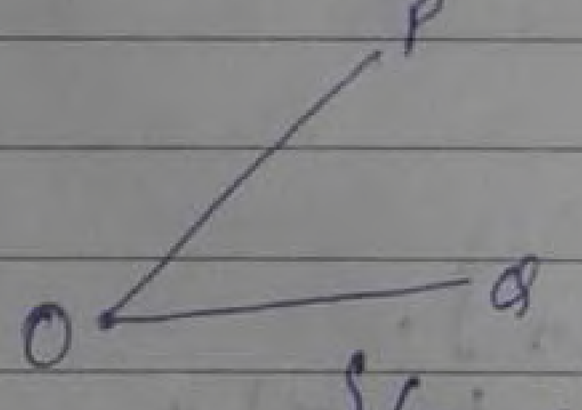
$\therefore$ Reflexive :- $(x,y) \in R \Rightarrow (x,x) \in R$
Here,

(9) $R \to Z \quad 0 \le x \le 12$
$R = \{1,2,3,4,5,6,7,8,9,10,11,12\}$.
(i) $R = \{(a,b) : |a-b|$ is a multiple of 4.

$\Rightarrow \quad (1,5) : |1-5| \Rightarrow 4.$
$(1,9) : |1-9| = 8$
$\{(1,5), (1,9)\}$.
$\therefore$ Reflexive :- $(x,y) \in R \Rightarrow (x,x) \in R$.
$(1,5) \in R \Rightarrow (1,1) \in R$
It is reflexive.

$\therefore$ Symmetric :- $(x,y) \in R \Rightarrow (y,x) \in R$.
$(1,5) \in R \Rightarrow (5,1) \in R$
It is symmetric

$(12,8), (8,4)$
$\therefore$ Transitive :- $(x,y) \in R$, $(y,z) \in R$ then $(x,z) \in R$
$\Rightarrow (1,9) \in R, (9, \ldots$
?? $(1,5) \in R, (5,$

(11)


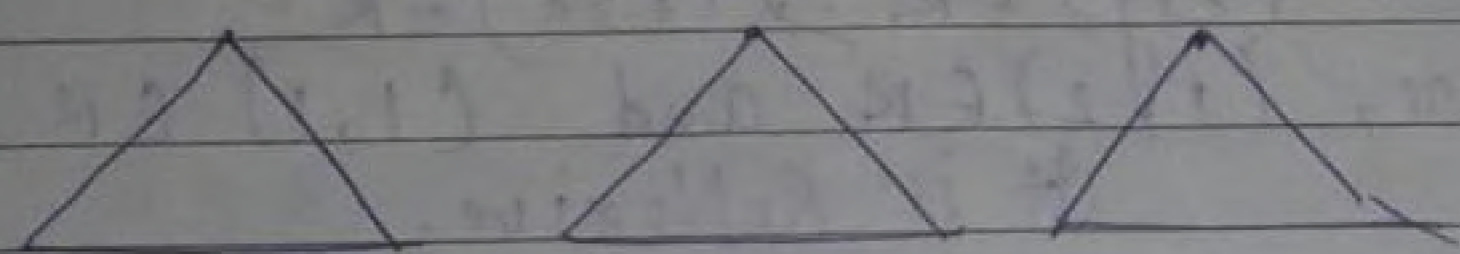
$\{(O,P), (O,Q)\}$.
Reflexive :- $(x,y) \in R \Rightarrow (x,x) \in R$
Here, $(O,P) \in R \Rightarrow (O,O) \in R$
It is Reflexive

∴ Symmetric :- $(x,y) \in R \Rightarrow (y,x) \in R$
Here, $(O,P) \in R \Rightarrow (P,O) \in R$
It is symmetric

∴ Transitive :- $(x,y) \in R$, $(y,z) \in R$ and $(x,z) \in R$
Here, $(O,P) \in R$, $(P,Q) \in R$ and $(O,Q) \in R$
It is Transitive.

(second part) → not done (understand).

(12)



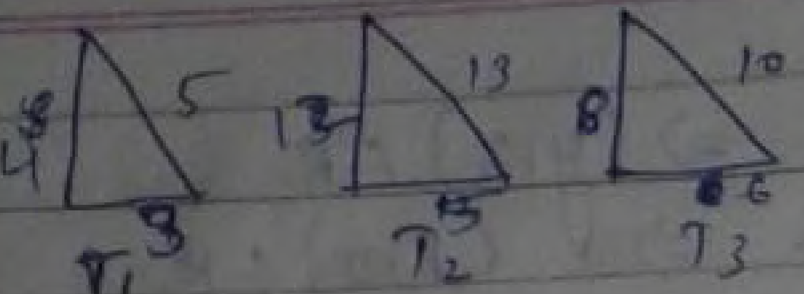
R

To prove :- $R = \{(T_1, T_2) : T_1$ is similar to $T_2\}$. is equivalence relation.

∴ Reflexive :- $(x,y) \in R \Rightarrow (x,x) \in R$.
$(T_1, T_2) \in R \Rightarrow (T_1, T_1) \in R$
It is Reflexive.

∴ Symmetric :- $(x,y) \in R \Rightarrow (y,x) \in R$.
Here, $(T_1, T_2) \in R$, $(T_2, T_1) \in R$
It is symmetric.

∴ Transitive :- $(x,y) \in R$, $(y,z) \in R$ and $(x,z) \in R$
Here, $(T_1, T_2) \in R$, $(T_2, T_3) \in R$ and $(T_1, T_3) \in R$. (Triangle)
It is Transitive



which Δ among T_1, T_2 and T_3 are related (second part) $\to$??

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

Reflexive :- $(x,y) \in R \Rightarrow (x,x) \in R$
Here, $(1,2) \in R$ and $(1,1) \in R$
It is Reflexive.

Symmetric :- $(x,y) \in R \Rightarrow (y,x) \in R$
Here, $(1,1) \in R \Rightarrow (1,1) \in R$
It is Symmetric.

Transitive :- $(x,y) \in R$, $(y,z) \in R$ then $(x,z) \in R$
Here, $(1,3) \in R$, $(3,1) \notin R$ then $(1,3) \in R$
It is not Transitive.
(A) is the right answer.
Hence, R is reflexive and Symmetric but not transitive.