$$((A \cap B^c) \cup C)^c \cap (D \cup E)^c$$

$$= ((A \cap B^c)^c \cap C^c) \cap (D^c \cap E^c)$$

$$= ((A^c \cup B) \cap C^c) \cap (D^c \cap E^c)$$

$$= ((A^c \cap C^c) \cup (B \cap C^c)) \cap (D^c \cap E^c)$$

$$(\{A^c \cap C^c\} \cap \{D^c \cap E^c\}) \cup (\{B \cap C^c\} \cap \{D^c \cap E^c\})$$

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

A

$B = \{1, \{1, 2\}, \{\}\}$

$R \subseteq A \times A$

if and only if

- R is reflexive iff

$aRa \quad \forall a \in A$

- R symmetric

If $aRb \Rightarrow bRa$

- R transitive

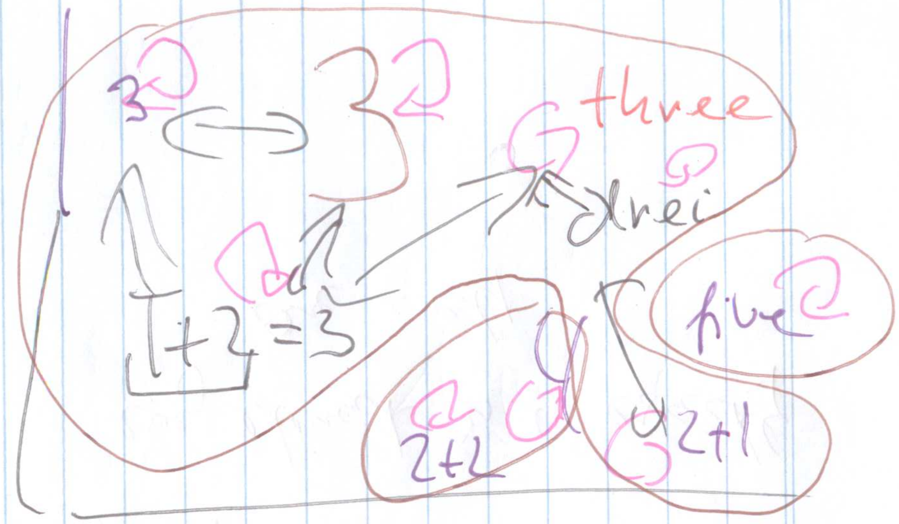
If $aRb,\ bRc \Rightarrow aRc$

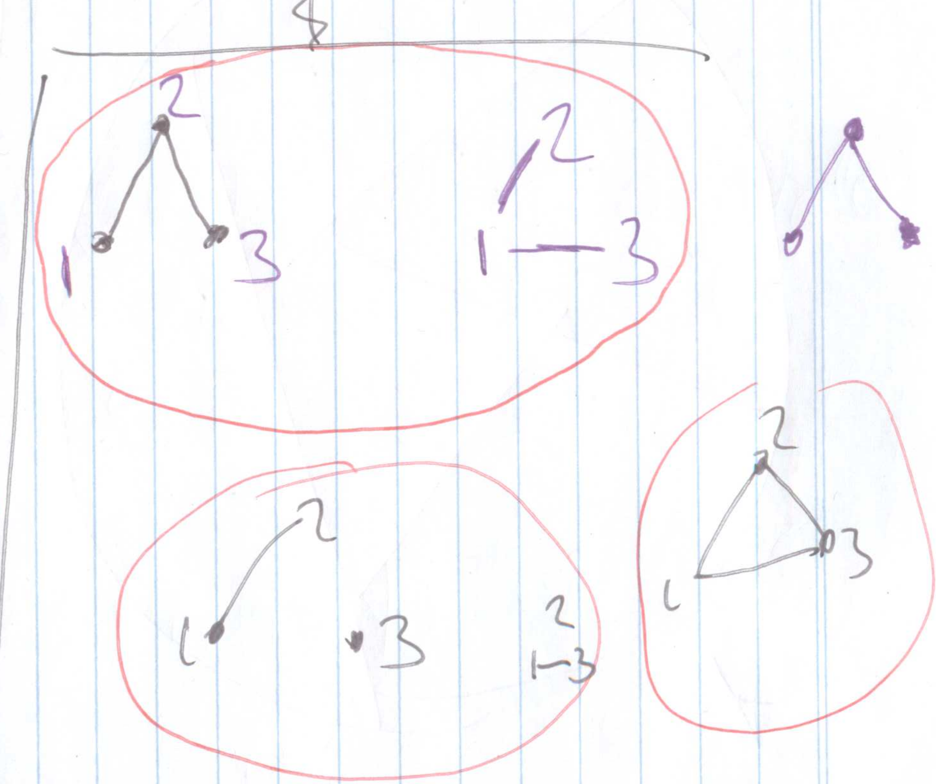
Counterexample: $D \subseteq \mathbb{Z} \times \mathbb{Z}$

$= \{(a,b) \mid |a-b| \leq 5\}$

Then $2\,D\,5,\ 5\,D\,10$

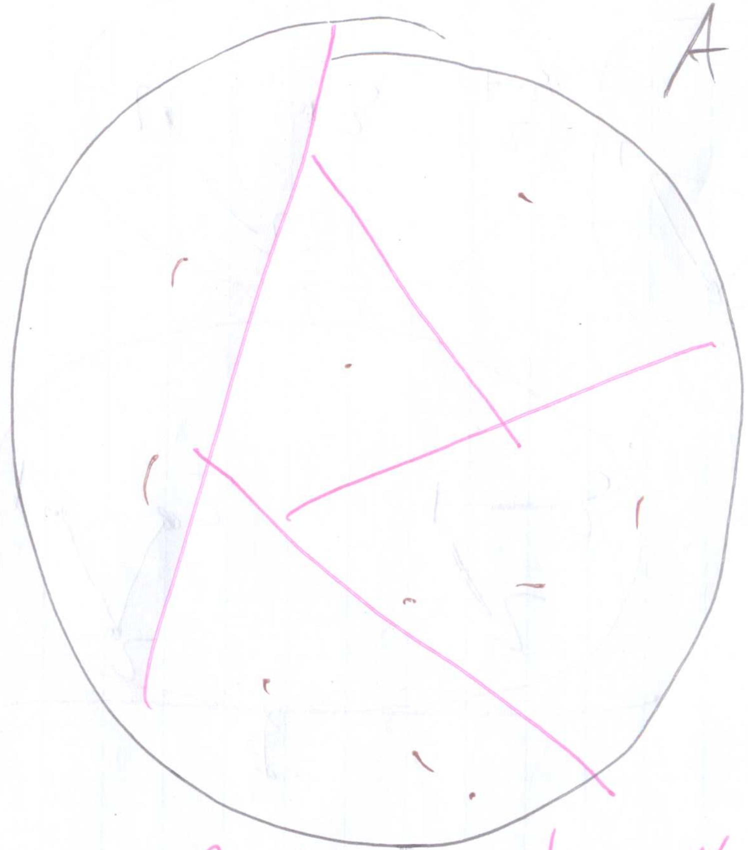
but $2 \not{D}\, 10$





R is <u>equivalence relation</u> if

symmetric + reflexive + transitive



Partition into cells

every element is in exactly one cell