



**NANYANG
TECHNOLOGICAL
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Discrete Mathematics

MH1812

Topic 8 - Relations Summary

Example

Consider the relation $R = \{(1,1), (1,2), (2,3)\}$ on the set $A = \{1,2,3\}$.

- Is it Reflexive? Symmetric? Anti-symmetric? Transitive?

\exists

(there exists)

Not reflexive

Not symmetric

Not anti-symmetric

Not transitive

Symmetry vs anti-symmetry

	Anti symmetric	Not anti-symmetric
Symmetric		
Not symmetric		

Example

Consider the relation $R = \{(x, y) \mid x \equiv y \pmod{2}\}$ on the set $A = \mathbb{N}$.

- Show that R is an equivalence relation.
- Show that the equivalence classes of R partition the set A .

Example

Let relation R be defined on set $A=\{a, b, c, d\}$ and $R=\{(a, b), (b, a), (b, c), (c, d)\}$.

- Find R^{-1} and R^t .
- Is R^t an equivalence relation, a partial order?