ECE335 Summer 2019 - Lecture 18 Examples

Example 1: Given the following set $A = \{1, 2, 3, 4\}$, define a binary relation as

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

a. Is R *reflexive*? Explain.

No. $(2,2) \notin R$

b. Is R *symmetric*? Explain.

No. $(2,1) \in R$ but $(1,2) \notin R$

c. Is R *transitive*? Explain.

Yes. $(2,1) \wedge (1,1) \rightarrow (2,1) \in R$
$(3,1) \wedge (1,1) \rightarrow (3,1) \in R$

Example 2: Given the following set $A = \{0, 2, 4, 6, 8, 10\}$, define a binary relation as

$$R = \{(0,6), (2,10), (4,8), (6,0), (8,4), (10,2)\}$$

a. Is R *reflexive*? Explain.

No. $(0,0) \notin R$

b. Is R *symmetric*? Explain.

Yes. $(0,6) \wedge (6,0) \in R$
$(2,10) \wedge (10,2) \in R$
$(4,8) \wedge (8,4) \in R$

c. Is R *transitive*? Explain.

No. $(0,6) \wedge (6,0) \in R$ but $(0,0) \notin R$