# CIS7 Unit 12 In-Class Assignment: Relations

Chapter 17 explains relations in domain and range. Refer to notes and chapter content. Answer the following questions.

1. Determine the **domain** and **range** of the following relation: {(1,3), (-2,7), (3,-3), (4,5), (1,-3)}. Determine whether the relation is a function.

Domain: {1, -2, 3, 4}

Range: {3, 7, -3, 5}

F: X -> Y

1. Identify the domain and range for the elements matched in the diagram below and determine whether the matches form a function.

Domain: {3, 4, 5, 6, 7}

Range: {2, 1, 9, 12}

F: X -> Y

1. Let A = {2,4,6} and B = {3,5,7,9}. Note the condition of R (equal to, greater than or less than).

A < B, R: x < y

{(2,3), (2,5), (2,7), (2,9), (4, 5), (4, 7), (4, 9), (6, 7), (6, 9)}

A > B, R: x > y

{(4, 3), (6, 3), (6, 5)}

R: x = y, A E A, B E B

{(2,2), (4,4), (6,6), (3,3), (5,5), (7,7), (9,9)}

1. Determine if the relation R is reflexive, symmetric and transitive for the following cases:

a = a, reflexive

a = b, b = a, Symmetric, Reflexive

a = b = c; a = c

Transitive

1. For each of these relations on the set {1, 2, 3, 4}, decide whether it is reflexive, whether it is symmetric, whether it is antisymmetric, and whether it is transitive.
2. {(2, 2),(2, 3),(2, 4),(3, 2),(3, 3),(3, 4)}

Reflexive: {(2,2), (3,3)}

Asymmetric: {(2,3), (3,2)}

Transitive: {(2,3), (3,4), (2,4)}

1. {(1, 1),(1, 2),(2, 1),(2, 2),(3, 3),(4, 4)}

Reflexive: {(1,1), (2,2), (3,3), (4,4)}

Asymmetric: {(1,2), (2,1)}

1. {(1, 1),(2, 2),(3, 3),(4, 4)}

Reflexive: {(1,1), (2,2), (3,3), (4,4)}

1. Determine whether the relation R on the set of all integers is reflexive, symmetric, antisymmetric, and/or transitive, where (x, y) ∈ R if and only if x ≥ y 2 .

Let x = 1, y = x if y = 1

(1,1)

Reflexive

Let x ≥ 2, y2 ≤ x if y = 1

(2,1), (3,1), …

Transitive

1. Determine whether the relation R on the set of all integers is reflexive, symmetric, antisymmetric, and/or transitive, where (x, y) ∈ R if and only if x ≠ y.

Cannot be reflexive (1,1), (2,2), … -> Irreflexive.

Could be symmetric, example: (1,2), (2,1)

Could be transitive, example: (1,2), (2,3), (1,3), …