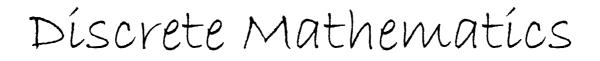
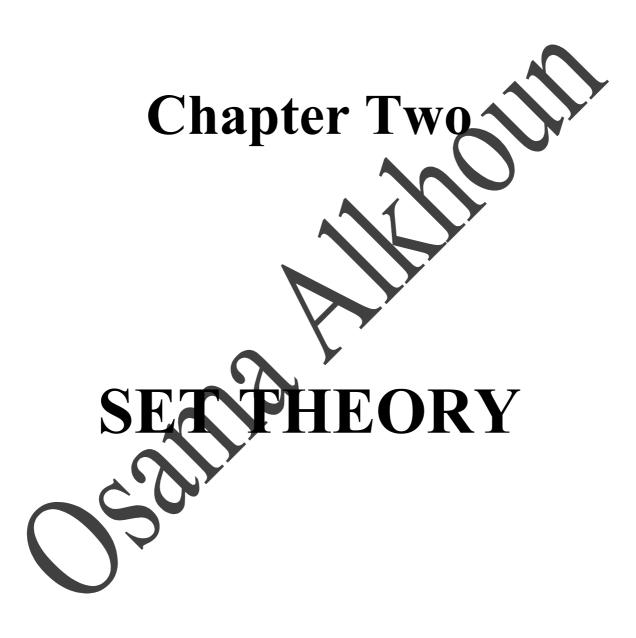
Department of Mathematics Faculty of Science Yarmouk University



## Yarmouk University

## Second Seme*s*ter 2009/2010

Done by: Osama Alkhoun



## Section 2.2 Set Rational

Definition:

If A and B are two sets, we say that A **contained** in B if **every elements** of A is also **an element** of B.

In symbols:  $A \subseteq B$  called A is **a subset** of B.

Example:  $A = \{1, 2, 3\}$  $B = \{0, 1, 2, 3, 4\}$  $A \subseteq B$ but B⊄A NOTE: To prove that  $A \subseteq B$  we must prove that if x is an e ement of A, then x must be an element of B. Question 1  $A = \{ x : x \text{ is an even integer } \}$  $B = \{x : x \text{ is an integer divisible by } 6\}$  $C = \{ x : x \text{ is an integer divisible by } 2 \text{ or }$  $D = \{x : x \text{ is an integer divisible by } 2 \text{ and} \}$ but 2 ∉ B 1. IS  $A \subseteq B$ ? NO 2. IS  $B \subset C_2$ **PROOF**:  $B = \{ x : x \text{ is an integer divisible by } 6 \}$ Let x be an element of B then  $(x/6 = n) \rightarrow (x = 6 n)$ . for some integer n. n (2(3n))/2 = 2= 3n  $\therefore$  x divisible by 2  $\therefore$  x is an element of C

3. C  $\subseteq$  B ? NO  $\rightarrow$  2  $\in$  C but 2  $\notin$  B

4. B  $\subset$  D ? YES (true) PROOF: Let x be an element of D x/2 = n x/3 = m  $2n = x \qquad 3m = x$  2n = 3m n = 3m/2  $\rightarrow m = 2y$ But 3m = xx = 6y

**NOTES:** 

- A = B if every element of A is an element of B and every element of B is an element of A.
- $A \subseteq B$  every element of A is an element of B
- $B \subseteq A$  every element of B is an element of A
- $A = B IFF A \subseteq B AND B \subseteq A$
- If  $A \subseteq B$  and  $A \neq B$ , then A is called a proper subset of B

To show that A is not contained in B we need only to show one element of A is not element of B

A = { 1, 2, 3 } B = { 1, 2, 4 } 3 ∈ A and 3 ∉ B → A ⊄ B osana hind