* **x** **∈** **A** if **x** is an element of **A**
* **x ∉ A if x is not an element of A**
* **A = {x | 1 < x < 5} here the | means “such that”**
* **A = {1,2,3,4,…} ellipsis represents infinite continuation**
* **You often have to specify a “universe of numbers” U**
* **U = {1,2,3…}, A = {1,4,9,16} = {x^2 | x ∈ U, x^2 < 20}**
* **|A| or n(A) represents cardinality, or the size of a set. A = {1,4,7,5}, |A| 4**
* **A = {1,2,3}, B = {1,2,3,4} – A is a subset of B, so A ⊆ B or B ⊇ A. Given** that here, b contains an element NOT in A, A is called a proper subset or strict subset, so A ⊂ B or B ⊃ A.
* Neither order nor repetition is relevant to a set.
* A ⊆ A.
* If A ⊆ B and B ⊆ A, then A = B.
* If A ⊆ B and B ⊆ C, then A ⊆ C.
* **∅** or **{}** means empty/null set
* If **A** is a set from universe **U**, the *power set* of **A**, denoted ***P*(A)** is the collection (or set) of all subsets of **A**.
* So if A = {1,2}, then P(A) = {**∅, {1}, {2}, A}**

**Some Useful Sets: Number Systems**

* **Z** =the set of *integers* **= {0,1,-1,2,-2,3,-3,…}**
* **N =** the *natural number*, set of non-negative integers of natural numbers = **{0,1,2,3,…}**
* **Z+ =** the set of *positive integers* = **{1,2,3,…}**
* **Q =** the set of *rational* numbers = **{a/b | a,b ∈ Z, b ≠ 0}**
* **Q+ =** the set of *positive rational* numbers **= {r | r ∈ Q, r>0)**
* **R =** the set of *real* numbers (includes irrationals)
* **R+ =** the set of *positive real* numbers
* **C** = the set of *complex* numbers

1. A,b,c, d
2. a, b, c, d, e, g, h
3. a, c, e, f, g, h
4. {2, 0}

{2, 2.5, 3+1/3, 5.2, 7+1/7}

{0, 2, 12, 36, 80}

{0.5, 1/12, 1/30, 1/56, 1/90, 1/132}

1. {x | x = rt(y), 1 < y <10, x**∈** Z}

{1/x | x**∈Z, 1<=x<=8}**

**{x^2 | X∈Z, 1<=x<=10}**

**{x^2 | x∈Z, 1<=x^2<=10}**

6)

7) false, true,