

L2 Number Sets

There are different types of numbers:

- Real Numbers:
 - Natural
 - Integers
 - Rational
 - Irrational
- Complex Numbers (aka Imaginary Numbers)

1

Definitions:

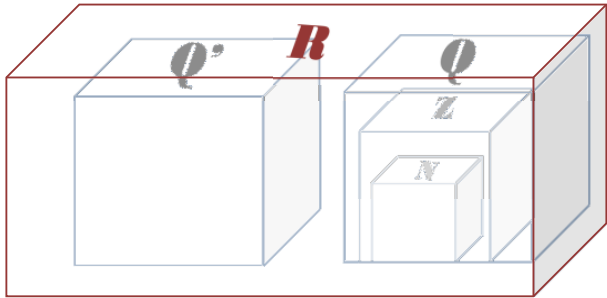
- N** : Set of **Natural numbers** : {0,1,2,3,...}
- N*** : Set of non zero natural numbers : {1,2,3,...}
- Z** : Set of **Integers** : {...,-3,-2,-1,0,1,2,3,...}
- Z*** : Set of non zero Integers : {...,-3,-2,-1, 1,2,3,...}
- Z₊** : Set of positive Integers: {0,1,2,3,...} same as **N**
- Z₋** : Set of negative Integers: {...,-3,-2,-1,0}
- Q** : Set of **Rational numbers**
(i.e. numbers that can be written as fractions including terminating decimals ($0.5 = \frac{1}{2}$), and repeating decimals ($0.\bar{5} = \frac{5}{9}$)

3

Definitions:

- Q'** : are Irrational Numbers, these are non-periodic (non-repeating), non-terminating decimals; so we cannot write them as fractions.
(Ex: π , $\sqrt{2}$, $\sqrt{3}$, $\sqrt[3]{4}$ etc.)
- R** : is the Set of Real Numbers , that is all Rational and Irrational numbers: **Q** $\cup$ **Q'**
- We read this: **Q** Union **Q** prime.

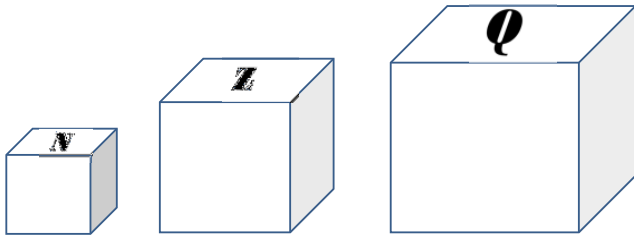
So if we were to put them in nesting boxes (or circles) they would look like this:



4

Ex 1 : place each number in the correct box.

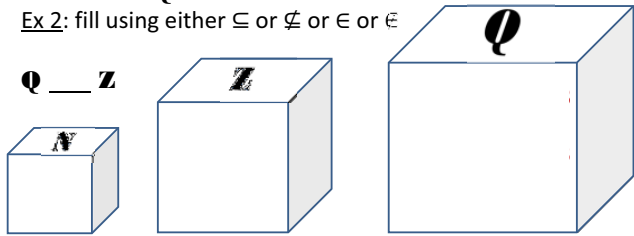
0 0.3 -3 -7 5 -2/3 100



5

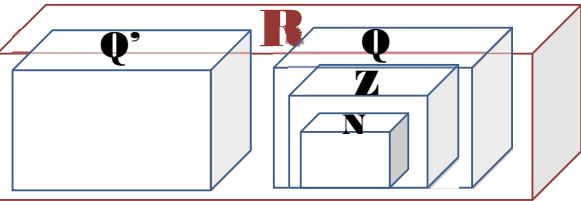
$\subseteq$ means subset; $\in$ means element of

N is a subset of **Z** is a subset of **Q** is a subset of **R**
N $\subseteq$ **Z** $\subseteq$ **Q** $\subseteq$ **R**
Ex 2: fill using either $\subseteq$ or $\not\subseteq$ or $\in$ or $\notin$

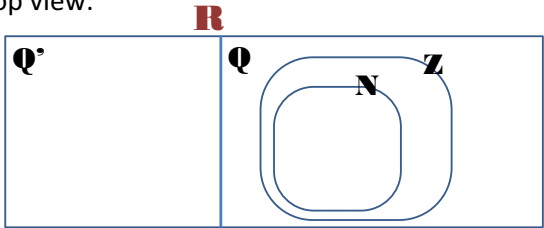


-3 $\subseteq$ **Z**
-3 $\in$ **N**

6



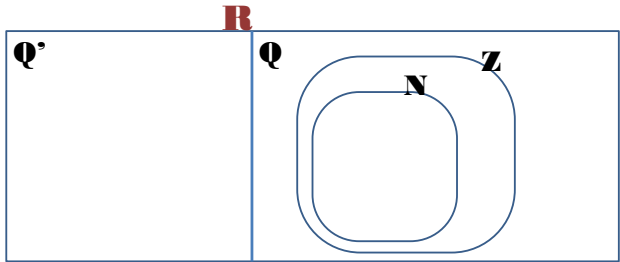
Top view:



7

Ex 3 : place each number in the correct box.

-1 -0.6 $-\sqrt{5}$ 11/7 -12 $\sqrt{4}$ 0.5 π 10 $\sqrt{2}$



8

Practice:
1.1 # 1-4



9