Cosmo School

Class – 7

Chapter – 1

Rational and Irrational Number

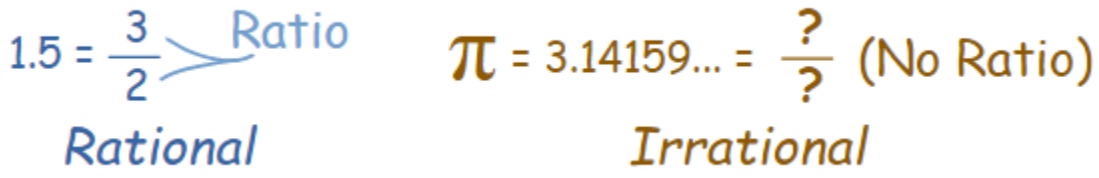
Lecture sheet – 1

Rational number: A rational number is a number that can be express as the ratio of two integers.

For example, one third in decimal form is 0.33333333333333 (the threes go on forever). However, one third can be express as 1 divided by 3, and since 1 and 3 are both integers, one third is a rational number.

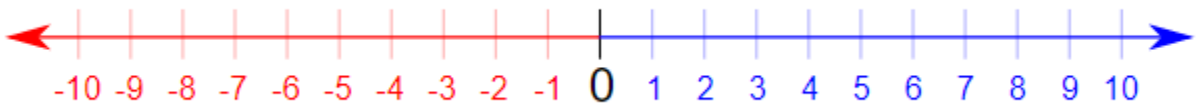
Irrational number: An Irrational Number is a real number that cannot be written as a simple fraction.

Irrational means not Rational



Integers

Integers are like whole numbers, but they also include negative numbers ... but still no fractions allowed!



So, integers can be negative {−1, −2, −3, −4, ... }, positive {1, 2, 3, 4, ... }, or zero {0}

We can put that all together like this:

Integers = {..., −4, −3, −2, −1, 0, 1, 2, 3, 4, ...}

Square are square roots:

A square is the product of multiplication of a number by itself and the number is the square root of the product.

$2 \times 2 = 2^2 = 4$

- The square of 2 is 4
- The square root of 4 is 2

Observe the following table:

Length of a side of Square (m)	Area of square (m^2)
1	$1 \times 1 = 1 = 1^2$
2	$2 \times 2 = 4 = 2^2$
3	$3 \times 3 = 9 = 3^2$
5	$5 \times 5 = 25 = 5^2$
7	$7 \times 7 = 49 = 7^2$
a	$a \times a = a^2$

* The characteristic of the number 1 , 4 ,9, 25 , 49 is that they can be expressed as square of any other integer 1, 4, 9. 25 and 49 numbers are square number.

* The square root of a perfect square number is a natural number. For example, the square of 5 is 5^2 or 25 which is a perfect square and square root of 441 is 21 which is a natural number.

If the digit in unit place is either 1 or 9, the digit in unit place of the square number will be 1.

Number	*Square number*
1	1
9	81
11	121
19	361

If the digit in the unit place is either 3 or 7, the digit in unit place of the square number will be 9.

Number	*Square number*
3	9
7	49
13	169

If the digit in unit place is either 4 or 6, the digit in unit place of the square number will be 6.

Number	*Square number*
4	16
6	36
14	196
16	256

Symbol of square root:

To express a square root, "√ " symbol is used. The square root of 25 is written as √25.

We know, 5 × 5 = 25, so the square root of 25 is 5.

Some important points on square and square root:

1. The number consisting of digit 2 or 3 or 7 or 8 at the extreme right, that is, in the unit place can never be a perfect square.

2. A number may be a perfect square if the digit at its unit place is 1 or 4 or 5 or 6 or 9. For example, 81, 64, 25 36, 49 etc. are perfect square.

3. If odd number of zeros are in the right of a number, it will not be a perfect square. For example, 10, 100, 2000 etc. are not perfect square.

4. If even number of zeros are at the right of a number, the number may be a perfect square. For example, 100, 4900 etc. are perfect square.

Exercise

1. Write the square of number from 1 to 20.
2. Will it be a square number if any number has any of the digits 0, 1, 4, 5, 6, 9 in its unit place.
3. What is the symbol of square root?
4. Will it be a square number if any number has any of the digits 2, 3, 7, 8 in its unit place?
5. If the digit in unit place is 4, what will be the digit in unit place of the square number?
6. If the digit in unit place is 7, what will be the digit in unit place of the square number?
7. If the digit in unit place is 9, what will be the digit in unit place of the square number?
8. If the digit in unit place is 6, what will be the digit in unit place of the square number?
9. If the digit in unit place is 1, what will be the digit in unit place of the square number?
10. Which of the following numbers are perfect square?
    2062, 1057, 23453, 33333, 1068.