FLORENCE INTERNATIONAL SCHOOL
CLASS- IX
WORKSHEET NO: 8
MATHS

NAME: **DATE: 08/04/2020**

TOPIC: RATIONAL AND IRRATIONAL NUMBERS

Please follow the link https://www.youtube.com/watch?v=aNOBaqFF0_M&feature=youtu.be
Representation of irrational numbers on number line:

Irrational number as a non-terminating non-repeating decimal.
Consider the following square roots of non-perfect square numbers (Irrational numbers).

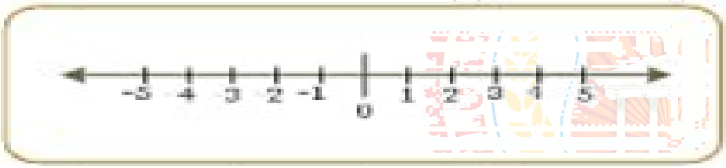
$\sqrt{2} = 1.4142135 \ldots\ldots$

$\sqrt{3} = 1.7320508 \ldots\ldots$

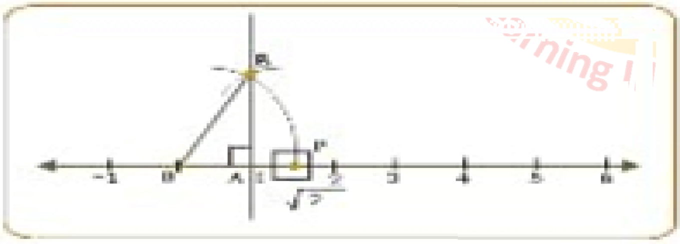
$\sqrt{5} = 2.2360680 \ldots\ldots$

All these are non-repeating, non-terminating decimals.
Hence, an alternate definition for an irrational number is:
Any number that cannot be expressed as a decimal with a finite number of digits is called an irrational number.
$\sqrt[3]{4}$, $\sqrt[3]{2}$, $\sqrt{6}$ etc., are some more examples of irrational numbers.

Geometrical Representation of Irrational Numbers
Every rational number has a unique position on the number line.



But does every point on the number line represent a rational number?
To verify let us draw a number line.



Consider a ∠ OAB such that
OA = 1 unit
AB = 1 unit
$\angle OAB = 90^{\circ}$

According to Pythagoras theorem,
$OB^2 = OA^2 + AB^2$

Some Properties of Rational Numbers
a) Every rational number is either a terminating decimal or a repeating decimal.
Example:

$\frac{3}{5} = 0.6$ (Terminating)

$\frac{6}{7} = 0.857142\overline{857142}$ (Repeating)

$\frac{9}{11} = 0.\overline{81}$ (Repeating)

$\frac{5}{8} = 0.625$ (Terminating)

EXERCISE

Answer the following questions in note book.

Q1. Represent the given numbers on the number line

(a) $\sqrt{2}$ (b) $\sqrt{3}$ (c) $\sqrt{5}$ (d) $\sqrt{7}$ (e) $\sqrt{19}$

Q2. Write the following in decimal form and say what kind of decimal expansion each has (terminating , non terminating and recurring)

(i) $\frac{36}{100}$ (ii) $\frac{1}{11}$ (iii) $\frac{3}{13}$ (iv) $4\frac{1}{8}$ (v) $\frac{2}{11}$ (vi) $\frac{329}{400}$