ODM EDUCATIONAL GROUP
Changing your Tomorrow

PERIOD-2

MATHEMATICS

CHAPTER NUMBER :~ 1
CHAPTER NAME :~ NUMBER SYSTEMS
SUB TOPIC :~ IRRATIONAL NUMBERS

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: 1800 120 2316
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

PREVIOUS KNOWLEDGE TEST

1. If 10 rational numbers are to be found between 2/7and 5/7, both the rational numbers are to be multiplied with 10/10.

2. Find six rational numbers between 3 and 4.

LEARNING OUTCOME:~

Students will learn

a) Representation of Irrationals on number line using Pythagoras theorem,

b) Representation of more Irrationals on number line using Pythagoras theorem

EXERCISE-1.1

Question 1.

Is zero a rational number? Can you write it in the form p/q, where p and q are integers and q ≠0?

Solution:

Yes, zero is a rational number it can be written in the form p/q.
0 = 01 = 02 = 03 etc. denominator q can also be taken as negative integer.

Question 3.

Find five rational numbers between 35 and 45.

Solution:

Since, we need to find five rational numbers, therefore, multiply numerator and denominator by 6.

$$\therefore \quad \frac{3}{5}=\frac{3\times 6}{5\times 6}=\frac{18}{30} \text{ and } \frac{4}{5}=\frac{4\times 6}{5\times 6}=\frac{24}{30}$$

$\therefore$ Five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$ are $\frac{19}{30}, \frac{20}{30}, \frac{21}{30}, \frac{22}{30}, \frac{23}{30}$.

Question 4.

State whether the following statements are true or false. Give reasons for your answers.

(i) Every natural number is a whole number.

(ii) Every integer is a whole number.

(iii) Every rational number is a whole number.

Solution:

(i) True

∵ The collection of all natural numbers and 0 is called whole numbers.

(ii) False

∵ Negative integers are not whole numbers.

(iii) False

∵ Rational numbers are of the form p/q, $q \neq 0$ and q does not divide p completely that are not whole numbers.

https://www.youtube.com/watch?v=g5vfSPAlrVM

"Numbers Are Intellectual Witness That Belong Only To Mankind…"

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IRRATIONAL NUMBERS

Any number that cannot be expressed in the form p/q, where p , q are integers is called irrational number.

Examples:- square roots such as $\sqrt{2}$.

Non repeating decimal expansion such as 0.10110011100011110000…

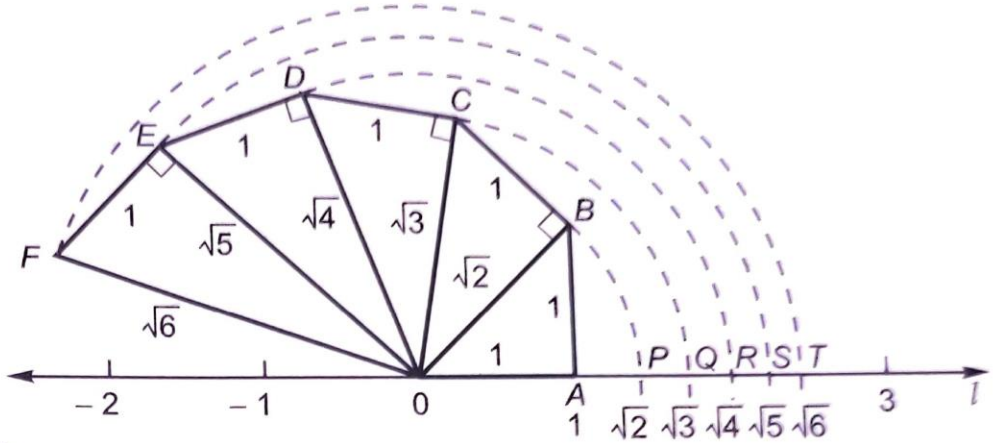
$$(\sqrt{2})^2 = 1^2 + 1^2$$

$$(\sqrt{3})^2 = (\sqrt{2})^2 + 1^2$$

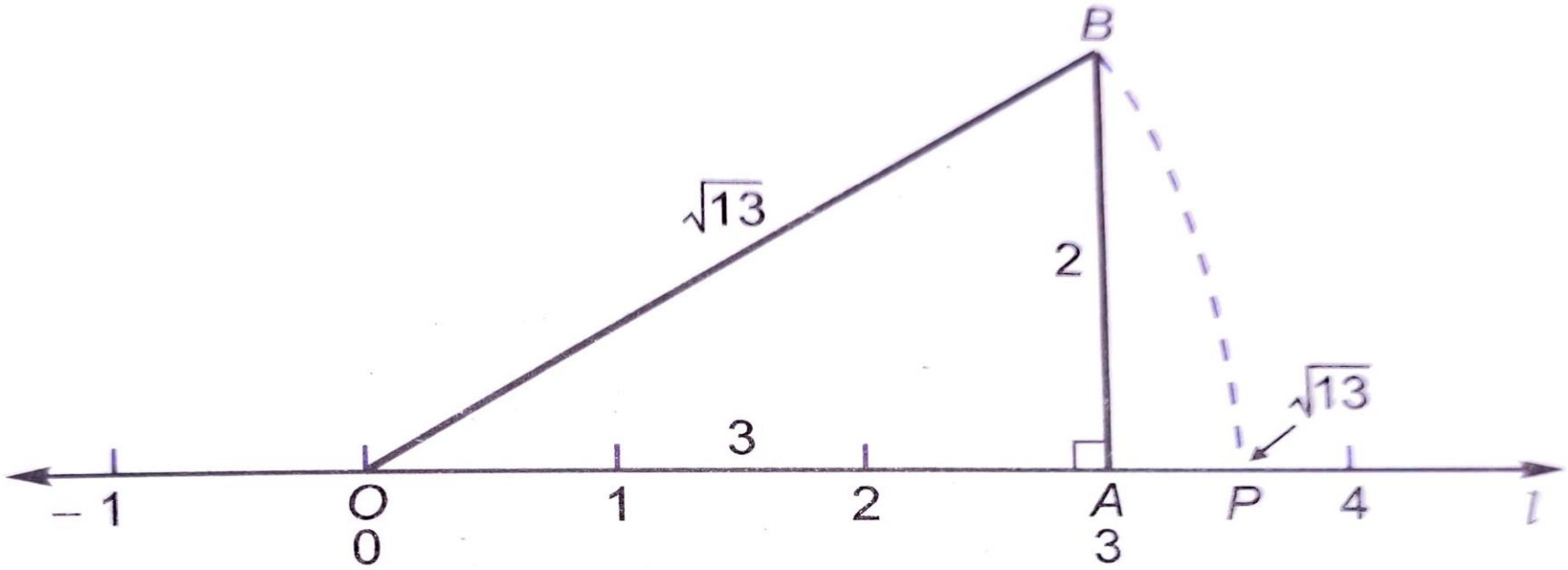
$$(\sqrt{4})^2 = (\sqrt{3})^2 + 1^2$$

$$(\sqrt{5})^2 = (\sqrt{4})^2 + 1^2$$

$$(\sqrt{6})^2 = (\sqrt{5})^2 + 1^2$$



Thus, the points P, Q, R, S and T respectively represent the numbers $\sqrt{2}, \sqrt{3}, \sqrt{4}$ or $2, \sqrt{5}$ and $\sqrt{6}$. By continuing this process, we can locate $\sqrt{n}$ for any positive integer n, after $\sqrt{n-1}$ has been located.



Evaluation:

Represent $\sqrt{3}$ on the number line.

Homework :

Exercise 1.2

AHA:~

1. Represent $\sqrt{9.1}$ on the number line.

2. Represent $\sqrt{5}$ on the number line by spiral method.

THANKING YOU

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