

Pg 14

2) Given:

$$\frac{1}{7} = 0.\overline{142857}$$

$$\frac{2}{7} = 2\left(\frac{1}{7}\right) = 2 \times 0.\overline{142857} = 0.\overline{285714}$$

$$\frac{3}{7} = 3\left(\frac{1}{7}\right) = 3 \times 0.\overline{142857} = 0.\overline{428571}$$

$$\frac{4}{7} = 4\left(\frac{1}{7}\right) = 4 \times 0.\overline{142857} = 0.\overline{571428}$$

$\frac{5}{7} =$ } Do in Notebook as H.W.

$$\frac{6}{7} =$$

3) i) $0.\overline{6}$

$$\text{Let } x = 0.\overline{6} \rightarrow \textcircled{1}$$

Multiply 10_x both L.H.S and R.H.S

$$10x = 6.\overline{6} \rightarrow \textcircled{2}$$

$$10x - x = 6.\overline{6} - 0.\overline{6}$$

$$9x = 6.0$$

$$x = \frac{6}{9} = \frac{2}{3}$$

$$\begin{array}{r} 6.66666\dots \\ - 0.66666\dots \\ \hline 6.00000 \end{array}$$

$\therefore x = \frac{2}{3}$ is in p/q form.

(ii) $0.4\overline{7}$

$$\text{Let } x = 0.4\overline{7} \rightarrow \textcircled{1}$$

Multiply 10_x with eqn $\textcircled{1}$ on both L.H.S and R.H.S

$$10x = 4.\overline{7} \rightarrow \textcircled{2}$$

Multiply 100_x with eqn $\textcircled{1}$ on both L.H.S and R.H.S

$$100x = 47.\overline{7} \rightarrow \textcircled{3}$$

Equation $\textcircled{3} - \textcircled{2}$

$$100x - 10x = 47.\bar{7} - 4.\bar{7}$$

$$90x = 43$$

$$\therefore x = \frac{43}{90}$$

$$47.7777\ldots$$

$$- 4.7777\ldots$$

$$43.0000$$

(iii) $0.\overline{001}$

Let, $x = 0.\overline{001} \rightarrow \textcircled{1}$

Multiply eqn $\textcircled{1}$ with 1000

$$1000x = 1.\overline{001} \rightarrow \textcircled{2}$$

Eqn $\textcircled{2} - \textcircled{1}$ gives.

$$999x = 1$$

$$x = \frac{1}{999}$$

Extra Problems:

1) $0.6\overline{54}$

2) $0.\overline{16}$

Do as H.W in C.W notebook.

4) Let, $x = 0.99999\ldots$

$$x = 0.\bar{9} \rightarrow \textcircled{1}$$

 $\times 10$ on both sides

$$10x = 9.\bar{9} \rightarrow \textcircled{2}$$

Eqn $\textcircled{2} - \textcircled{1}$ gives.

$$10x - x = 9.\bar{9} - 0.\bar{9}$$

$$9x = 9$$

$$x = \frac{9}{9}$$

$$x = 1$$

$$x = 1$$

5) $1/17 = 0.0588235294117647058$

$$\begin{array}{r} 17 \overline{) 100} \\ \underline{85} \end{array}$$

$$150$$

$$\underline{136}$$

$$140$$

$$\underline{136}$$

$$40$$

$$\underline{34}$$

$$60$$

$$\underline{51}$$

$$90$$

$$\underline{85}$$

$$50$$

$$\underline{34}$$

$$160$$

$$\underline{153}$$

$$70$$

$$\underline{68}$$

$$20$$

$$\underline{17}$$

$$30$$

$$\underline{17}$$

$$130$$

$$\underline{119}$$

$$110$$

$$\underline{102}$$

$$80$$

$$\underline{68}$$

$$120$$

$$\underline{119}$$

$$\begin{array}{r} 100 \\ \underline{85} \\ 150 \end{array}$$

∴ After ¹⁶ digits it is repeated.

b) A rational number of the form p/q , $q \neq 0$ is a terminating decimal if $q = 2^m \times 5^n$ where m and n are integers.

Example: $\frac{36}{100} = \frac{36}{2^2 \times 5^2}$, $\frac{11}{8} = \frac{11}{2^3 \times 5^0}$

7) Irrational Nos \rightarrow Non terminating and Non repeating.

(i) $0.10100100010000 \dots$

(ii) $1.30300300030000 \dots$

(iii) $0.410410041000410000 \dots$

8) 3 irrational nos between $\frac{5}{7}$ and $\frac{9}{11}$

$$7 \overline{) 50} \\ \underline{49} \\ 10 \\ \underline{7} \\ 30 \\ \underline{28} \\ 20 \\ \underline{14} \\ 60 \\ \underline{56} \\ 40 \\ \underline{35} \\ 50 \\ \underline{49} \\ 10 \\ \underline{7} \\ 3$$

$$11 \overline{) 90} \\ \underline{88} \\ 20 \\ \underline{11} \\ 90 \\ \underline{88} \\ 20 \\ \underline{11} \\ 90 \\ \underline{90} \\ 0$$

$$\frac{5}{7} = 0.\overline{714285}$$

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

$$\therefore 0.720720072000 \dots$$

$$0.730730073000 \dots$$

$$0.760760076000 \dots$$

$$0.8080800800080000 \dots$$

- 9) i) $\sqrt{23}$ = Irrational number.
 ii) $\sqrt{225} = 15$ = Rational number.
 iii) 0.3796 = Terminating Decimal = Rational number.
 iv) 1.478478 = Non Terminating and Repeating = Rational Number.
 v) $1.101100100010001\dots$ = Non Terminating and Non Repeating = Irrational.

III Surds:

$\sqrt[n]{a}$ or $a^{1/n}$
 $a \rightarrow$ radicand
 $n \rightarrow$ index/power/order of surd
 $\sqrt{}$ \rightarrow Radical symbol.

Given in introduction p to 12 to 26.

Pure and Mixed Surd

Ex - 1.5 Pg 24.

I) (i) $2 - \sqrt{5}$ - Irrational $\because r - s = \text{Irr}$

(ii) $(3 + \sqrt{23}) - \sqrt{23} = 3 + \sqrt{23} - \sqrt{23} = 3$
 = Rational

(iii) $\frac{2\sqrt{7}}{7\sqrt{7}} = \frac{2}{7} = 0.\overline{285714}$
 = Non terminating and repeating
 = Rational

(iv) $\frac{1}{\sqrt{2}}$ = Irrational

(v) 2π = Irrational -

If x is a rational number
 s is an irrational number.

then, $x+s$ = Irrational no.

$x-s$ = "

$x \times s$ = "

$x \div s$ = "

Pg 42) (i) $(3+\sqrt{3})(2+\sqrt{2})$
 $= 6 + 3\sqrt{2} + 2\sqrt{3} + \sqrt{6}$ //

(ii) $(3+\sqrt{3})(3-\sqrt{3})$
 $= 9 - 3\sqrt{3} + 3\sqrt{3} - 3$
 $= 9 - 3$
 $= 6$

(iii) $(\sqrt{5}+\sqrt{2})^2$
 $= (\sqrt{5})^2 + 2(\sqrt{5})(\sqrt{2}) + (\sqrt{2})^2$ $\because (a+b)^2 = a^2 + 2ab + b^2$
 $= 5 + 2\sqrt{10} + 2$
 $= 5+2 + 2\sqrt{10}$
 $= 7+2\sqrt{10}$

(iv) $(\sqrt{5}-\sqrt{2})(\sqrt{5}+\sqrt{2})$
 $= (\sqrt{5})^2 - (\sqrt{2})^2$ $\because (a^2-b^2) = (a+b)(a-b)$
 $= 5 - 2$
 $= 3$

SBIOA SENIOR SECONDARY SCHOOL, TRICHY-7

STD:9

MATHEMATICS

DATE:20.05.2020

1.TEXT BOOK CHAPTER 1 PDF LINK IS GIVEN BELOW

<https://drive.google.com/open?id=1s06QoI4AGXVCljJ2TfKpst7xv9wspqzm>

2. CHAPTER 1 – MIND MAP

<https://drive.google.com/open?id=1zga67-pvIcrINcXdh5o-FSecbxI7elBp>

3. INTRODUCTION NOTES (WHICH IS TO BE COPIED IN A SEPARATE NOTEBOOK)

https://drive.google.com/open?id=1IcfyHGshThiJ-eqpiLObXamp_w5VEF_N

4. INTRODUCTION PDF FOR REFERENCE.

<https://drive.google.com/open?id=1qbI9khBfCAvSoN-n2r7LF0EKPYU8MESc>

SB/10A SENIOR SECONDARY SCHOOL - TRICHY

STD: IX

MATHEMATICS

CHAPTER - 1

NUMBER SYSTEM.

Ex - 1.1 Pg 5

1) Yes, 0 is a rational number which can be written as. $\frac{0}{1}$, $\frac{0}{20}$, $\frac{0}{15}$, ...

2) Find six rational numbers between 3 and 4.

Ans: $\frac{3}{1}$ and $\frac{4}{1}$ (or) $\frac{3 \times 7}{1 \times 7} = \frac{21}{7}$ and $\frac{4 \times 7}{1 \times 7} = \frac{28}{7}$

$$\frac{3 \times 10}{1 \times 10} = \frac{30}{10} \quad \text{and} \quad \frac{4 \times 10}{1 \times 10} = \frac{40}{10}$$

$$\frac{22}{7}, \frac{23}{7}$$

$$\frac{24}{7}, \frac{25}{7}$$

$$\frac{31}{10}, \frac{32}{10}, \frac{33}{10}, \frac{34}{10}, \frac{35}{10}, \frac{36}{10}, \frac{37}{10}, \frac{38}{10}, \frac{39}{10}$$

$$\frac{26}{7}, \frac{27}{7}$$

3) Find five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$

Ans: $\frac{4}{5}$

$$\frac{3 \times 10}{5 \times 10} = \frac{30}{50} \quad \text{and} \quad \frac{4 \times 10}{5 \times 10} = \frac{40}{50}$$

$$\frac{31}{50}, \frac{32}{50}, \frac{33}{50}, \frac{34}{50}, \frac{35}{50}, \frac{36}{50}, \frac{37}{50}, \frac{38}{50}, \frac{39}{50}$$

4) (i) Every natural no. is a whole number - True

(ii) Every integer is a whole number - False

(iii) Every rational number is a whole number - False

Extra Problems:

1) a) Write 4 Rational nos. between $-\frac{3}{7}$ and $\frac{2}{5}$

Ans: L.C.M (7,5) = 35

$$-\frac{3}{7} \times \frac{5}{5} = -\frac{15}{35} \quad \text{and} \quad \frac{2}{5} \times \frac{7}{7} = \frac{14}{35}$$

$$-\frac{14}{35}, -\frac{13}{35}, -\frac{12}{35}, \dots, \frac{0}{35}, \frac{1}{35}, \dots, \frac{11}{35}, \frac{12}{35}, \frac{13}{35}$$

b) $-\frac{4}{9}$ and $\frac{3}{7}$

H.W problem do in C.W (Maths notebook)

2) Write five Rational number between 0 and 0.3

Ans: $\frac{0}{1}$ and $\frac{3}{10}$ L.C.M = 10

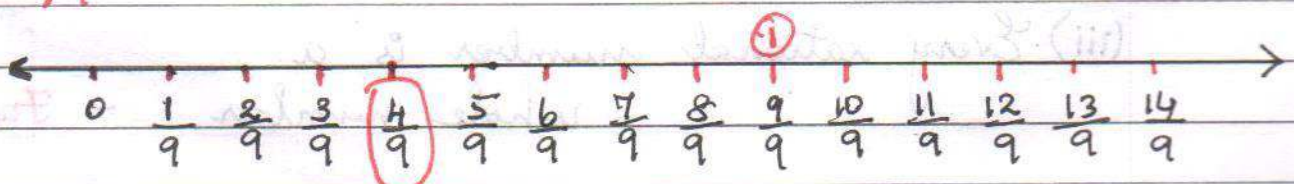
$$\frac{0}{1} \times \frac{10}{10} = \frac{0}{10} \quad \text{and} \quad \frac{3}{10} \times \frac{1}{1} = \frac{3}{10}$$

$$\frac{0}{10} \times \frac{10}{10} = \frac{0}{100} \quad \text{and} \quad \frac{3}{10} \times \frac{10}{10} = \frac{30}{100}$$

$$\frac{1}{100}, \frac{2}{100}, \dots, \frac{27}{100}, \frac{28}{100}, \frac{29}{100}$$

Representation of a Rational Number on a number line:

1) $\frac{4}{9}$.

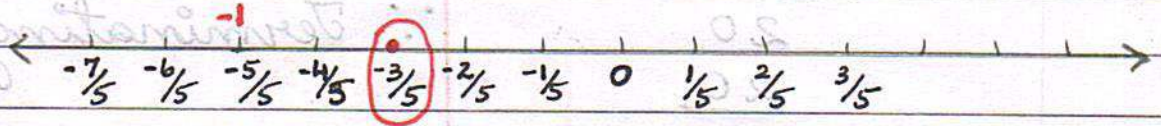


05.06.2020

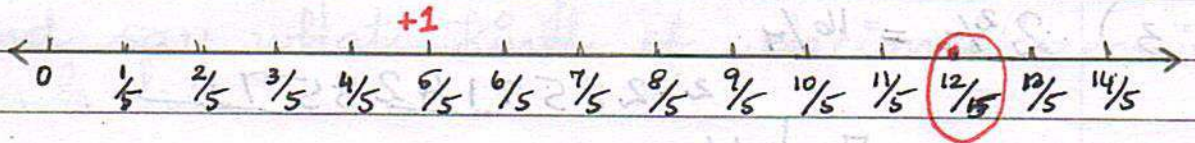
2) $\frac{5}{11}$

Home Work

3) $\frac{-3}{5}$



4) $2\frac{2}{5} = \frac{12}{5}$



III Real Numbers and their Decimal Expansion:

* Decimal expansion of a rational no. is either terminating or non-terminating recurring

* Decimal expansion of an irrational number is non-terminating and non-recurring.

Examples:

1) $\frac{2}{3} \rightarrow$ Real no.

$$\begin{array}{r} 0.66 \\ 3 \overline{) 20} \\ \underline{18} \\ 20 \end{array}$$

$$\begin{array}{r} 20 \\ \underline{18} \\ 2 \end{array}$$

$$\begin{array}{r} 2 \\ \dots \end{array}$$

$$\frac{2}{3} = 0.66 \dots \dots$$

$$= 0.\overline{6}$$

$\therefore \frac{2}{3}$ is a rational number

\therefore Non-terminating and Recurring decimal

$$2) \frac{10}{4}$$

$$\begin{array}{r} 2.5 \\ 4 \overline{) 10} \\ \underline{8} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

$\frac{10}{4} = 2.5$ is a rational number

\therefore Terminating Decimal.

$$3) 2\frac{2}{7} = \frac{16}{7}$$

$$\begin{array}{r} 2.28571428571 \\ 7 \overline{) 16} \\ \underline{14} \\ 20 \\ \underline{14} \\ 60 \\ \underline{56} \\ 40 \\ \underline{35} \\ 50 \\ \underline{49} \\ 10 \\ \underline{7} \\ 30 \\ \underline{28} \\ 20 \\ \underline{14} \end{array}$$

$$\therefore \frac{16}{7} = 2.28571428571$$

Non-terminating decimal

$$\begin{array}{r} 60 \\ \underline{56} \\ 40 \\ \underline{35} \\ 50 \\ \underline{49} \\ 10 \\ \underline{7} \\ 3 \end{array}$$

4) $\frac{11}{8}$ and 5) $1\frac{7}{9}$

Do the H.W in C.W

Ex - 1.3 Pg 14

1) Write the following in decimal form and say what kind of decimal expansion each has:

(i) $\frac{36}{100} = 0.36$ Terminating Decimal.

(ii) $\frac{1}{11}$

$$\begin{array}{r}
 0.090909 \dots \\
 11 \overline{) 100} \\
 \underline{99} \\
 100 \\
 \underline{99} \\
 100 \\
 \underline{99} \\
 1
 \end{array}$$

$\therefore \frac{1}{11} = 0.\overline{09}$

Non-terminating and repeating decimal.

Remaining problem (iii) to (vi) homework do it in C.W.