

Std-9

Number System

- (1) Natural no. 1 to ∞
- (2) Whole no. 0 to ∞
- (3) Integers. P/N
- (4) Rational no. $\frac{p}{q}$
- (5) Irrational no.
- (6) Equivalent ration no.
- (7) Method to Determine Rationals between two numbers.
- (8) Locate an irrational no on the number line

(9) Decimal Expression of Real Numbers

↓
Remainder
become zero

$$\text{Ex} - \frac{1}{4} = 0.25$$

↓
Remainder
Never becomes
zero.

$$\frac{1}{7} = 0.14285714$$

Decimal Expression of Irrational numbers

→ A number whose decimal expression is non terminating non recurring is irrational

— Irrational no (decimals)

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Find an irrational no. between $\frac{1}{7}$ and $\frac{1}{3}$

$$\frac{1}{7} = 0.142857$$

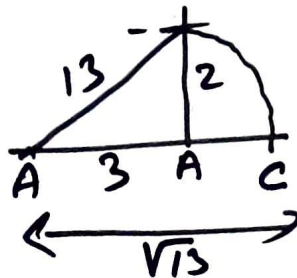
$$\frac{1}{3} = 0.333 = 0.\overline{3}$$

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Locate an irrational number on the number line. Here $13 = 9 + 4$

$$\sqrt{13} =$$

Here $13 = 9 + 4$
 $= 3^2 + 2^2$



H.W
14/04/20

Number System

- Q1 Find Six rational numbers between 3 and 4
Q2 Find Five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$
Q3 Find rational number between -5 and -6
Q4 Find Nine rational number between 0 and 0.1
Q5 Find four rational number lying between $\frac{3}{5}$ and $\frac{2}{3}$

Number line (Irrational no.)

- Q1 Locate $\sqrt{2}$ on the no. line.
Q3 Locate, $\sqrt{3}$, $\sqrt{5}$, $\sqrt{7}$, $\sqrt{10}$, $\sqrt{13}$ on the no line

Irrational no.

Assignment for IX/A class

Q:→1 write five rational numbers between 3 and 4

Q:→2 Find four rational numbers between $\frac{2}{3}$ and $\frac{5}{3}$

Q:→3 Convert the following rational numbers into decimal

(i) $\frac{13}{4}$

(ii) $\frac{145}{8}$

(iii) $\frac{874}{999}$

Q:→4 Express each of the following in $\frac{p}{q}$ form

(i) $0.\bar{7}$ (ii) $0.\bar{32}$ (iii) $0.4\bar{7}$

Q:→5 Express $0.8 + 0.\bar{9} + 0.\bar{67}$ in $\frac{p}{q}$ form

Q:-6 show how $\sqrt{5}$ can be represented on the number line

Q:→7 you know that $\frac{1}{7} = 0.\overline{142857}$. can you predict what the decimal expansions of $\frac{2}{7}$, $\frac{3}{7}$, $\frac{4}{7}$, $\frac{5}{7}$, $\frac{6}{7}$ are, without actually doing the long division? If so, how?

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16.04.2020

4. Rationalise the denominator and simplify:

$$(i) \frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}}$$

$$(ii) \frac{\sqrt{7} + \sqrt{2}}{9 + 2\sqrt{14}}$$

$$(iii) \frac{3 - 2\sqrt{2}}{3 + 2\sqrt{2}}$$

$$(iv) \frac{y^3}{\sqrt{x^2 + y^2} + x}$$

$$(v) \frac{3\sqrt{2} + 1}{2\sqrt{5} - 3}$$

$$(vi) \frac{7 + 3\sqrt{5}}{7 - 3\sqrt{5}}$$

$$(vii) \frac{\sqrt{7} - \sqrt{5}}{\sqrt{7} + \sqrt{5}}$$

$$(viii) \frac{\sqrt{11} - \sqrt{7}}{\sqrt{11} + \sqrt{7}}$$

$$(ix) \frac{\sqrt{2} + \sqrt{3}}{\sqrt{2} - \sqrt{3}}$$

$$(x) \frac{4\sqrt{3} + 5\sqrt{2}}{4\sqrt{3} + 3\sqrt{2}}$$

$$(xi) \frac{2\sqrt{3} - \sqrt{5}}{2\sqrt{3} + 3\sqrt{5}}$$

$$(xii) \frac{\sqrt{3} + 1}{2\sqrt{2} - \sqrt{3}}$$

5. Rationalise the denominator of each of the following:

$$(i) \frac{1}{\sqrt{2} + \sqrt{3} + \sqrt{5}}$$

$$(ii) \frac{1}{3 + \sqrt{5} - 2\sqrt{2}}$$

$$(iii) \frac{6}{3 + \sqrt{2} - \sqrt{5}}$$

$$(iv) \frac{1}{\sqrt{7} + \sqrt{6} - \sqrt{13}}$$

6. Find the values of a and b in each of the following:

$$(i) \frac{\sqrt{3} - 1}{\sqrt{3} + 1} = a + b\sqrt{3}$$

$$(ii) \frac{3 - \sqrt{5}}{3 + 2\sqrt{5}} = a\sqrt{5} - b$$

$$(iii) \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} = a + b\sqrt{15}$$

$$(iv) \frac{\sqrt{2} - \sqrt{5}}{\sqrt{2} + \sqrt{5}} = a + b\sqrt{10}$$

$$(v) \frac{3 + \sqrt{7}}{3 - \sqrt{7}} = a + b\sqrt{7}$$

$$(vi) \frac{\sqrt{11} - \sqrt{7}}{\sqrt{11} + \sqrt{7}} = a - b\sqrt{77}$$

$$(vii) \frac{1 + \sqrt{6}}{3 + \sqrt{6}} = a + b\sqrt{6}$$

$$(viii) \frac{3 + 2\sqrt{2}}{2 - \sqrt{2}} = a + b\sqrt{2}$$

$$(ix) \frac{4 + 3\sqrt{5}}{4 - 3\sqrt{5}} = a + b\sqrt{5}$$

$$(x) \frac{5 + \sqrt{3}}{7 - 4\sqrt{3}} = a + b\sqrt{3}$$

$$(xi) \frac{\sqrt{5} - 1}{\sqrt{5} + 1} + \frac{\sqrt{5} + 1}{\sqrt{5} - 1} = a + b\sqrt{5}$$

$$(xii) \frac{5 - \sqrt{6}}{5 + \sqrt{6}} = a - b\sqrt{6}$$

7. Simplify each of the following by rationalising the denominator.