STD – 9   MATHS

CHAPTER - 1

NUMBER SYSTEM

EXERCISE - 1.5 (Q.1)

Q.1. Classify following numbers as rational or irrational :

(i) $2 - \sqrt{5}$

➢ We know that, $\sqrt{5}$ = 2.2360679...

Here, 2.2360679... is non-terminating and non

recurring. Now, substituting the value of $\sqrt{5}$ in $2 - \sqrt{5}$,

we get,

$= 2 - \sqrt{5} = 2 - 2.2360679...$

$= - 0.2360679$

Since the number, -0.2360679..., is non-terminating non-recurring, $2 - \sqrt{5}$ is an irrational number.

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

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

$= 3$

Since the number 3/1 is in p/q form, $(3 + \sqrt{23}) - \sqrt{23}$ is rational.

(iii) $\dfrac{2}{7}\dfrac{\sqrt{7}}{\sqrt{7}}$

$\dfrac{2}{7}\dfrac{\sqrt{7}}{\sqrt{7}} = \dfrac{2}{7} \times \dfrac{\sqrt{7}}{\sqrt{7}}$

We know that $\left(\dfrac{\sqrt{7}}{\sqrt{7}}\right) = 1$

Hence, $\left(\dfrac{2}{7}\right) \times \left(\dfrac{\sqrt{7}}{\sqrt{7}}\right)$

$= \left(\dfrac{2}{7}\right) \times 1$

$= \left(\dfrac{2}{7}\right)$

Since the number, $\dfrac{2}{7}$ is in p/q form, $\dfrac{2}{7}\dfrac{\sqrt{7}}{\sqrt{7}}$ is rational number.

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

Multiplying and dividing numerator and denominator by $\sqrt{2}$ we get,

$$= \left(\frac{1}{\sqrt{2}}\right) \times \left(\frac{\sqrt{2}}{\sqrt{2}}\right)$$

$$= \frac{\sqrt{2}}{2} \text{ (since } \sqrt{2} \text{ x } \sqrt{2} = 2\text{)}$$

We know that,

$\sqrt{2} = 1.4142...$

Then, $\dfrac{\sqrt{2}}{2}$

= 1.4142/2

= 0.7071..

Since the number, 0.7071..is non-terminating non-recurring

Hence , $\dfrac{1}{\sqrt{2}}$ is an irrational number.
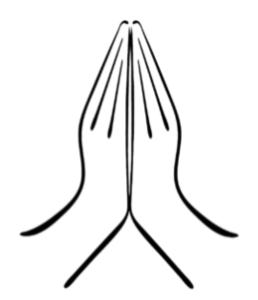
(v) 2π

We know that, the value of π = 3.1415

Hence, 2π = 2 $\times$ 3.1415..

$\qquad\qquad$ = 6.2830...

Since the number, 6.2830..., is non-terminating non-recurring, 2π is an irrational number.

Thanks

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For watching