Nishant Jindal

Revise.

① N ② W ③ I ④ I^+ / I^-

⑤ Non-ve / Non+ve

(6) Prime No ⑦ Composite.

(8) Coprime = HCF$(N_1, N_2) = 1$

(9) Twin Prime → Prime with diff = 2

(10) R / Irr ⇒ Q / Q'

Home Work.

1 — 21 table.

$\sqrt{\ }$ $\sqrt[3]{\ }$ $\sqrt[4]{\ }$

Sq. Root

$\sqrt{1} = 1$

$\sqrt{2} \simeq 1.414$

$\sqrt{3} \simeq 1.732$

$\sqrt{4} = 2$

$\sqrt{5} \simeq 2.236$

$\sqrt{6} \simeq 2.449$

$\sqrt{7} \simeq 2.645$

$\sqrt{8} \simeq 2.828$

$\sqrt{9} = 3$

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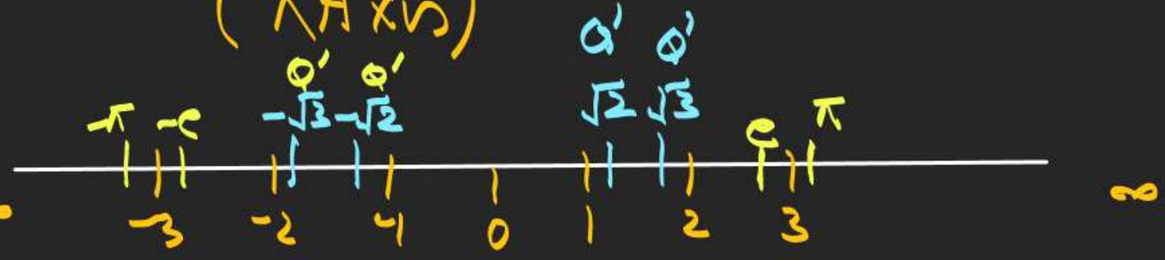
Fundamentals of Mathematics

Sqⁿ Root of 10 to 16
Cube Root of 1 - 12

(4) Real No. are Rep. on Real Axis (X Axis)



(1) Real No → All Rational & Irr. No are Combined as Real No.

2) It is Rep. by R.

(3) $R = Q \cup Q'$

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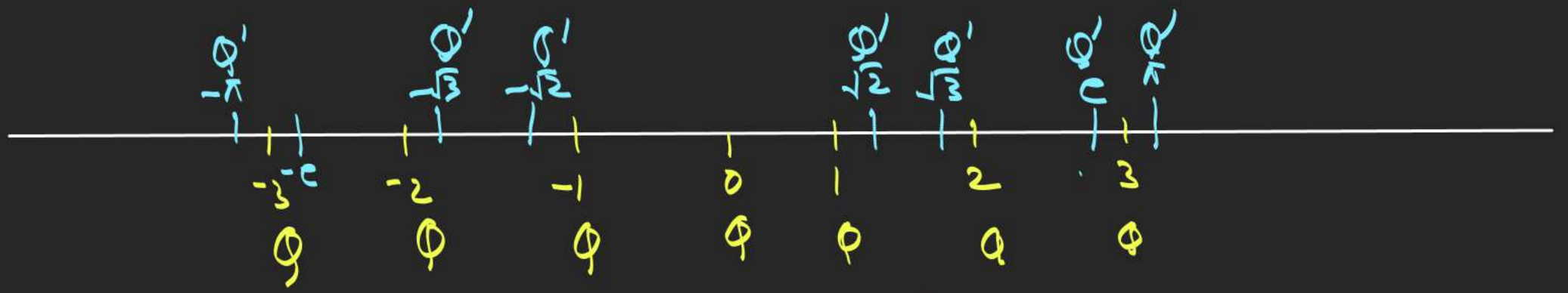
Fundamentals of Mathematics



$$R = Q \cup Q'$$

Hmari No Line Par Sirf Rational No. hi nahi hote
Baki Irr No b Hote.
Domain Par Real No. Line.
Bnate hain

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Fundamentals of Mathematics

Q 0 is Integer or not?

Yes.

Q "0" is +ve or -ve Integer [T/F]

False ⇒ 0 is niether +ve nor -ve

Q $\pi \simeq 3.141$

Q $\frac{\pi}{2} \simeq 1.57$

Q $e \simeq 2.718$

Q $\sqrt{2}$ is $\mathbb{Q}'$?

Yes.

Q 5 is $\mathbb{Q}$?

5 is Rational

Q $5.14 = \mathbb{Q}$.

after decimal only 2 different digits are coming ⇒ it is Rational

Q $2.555555\ldots = $ Irr No.

After decimal Digits are Repeating ⇒ Rational.

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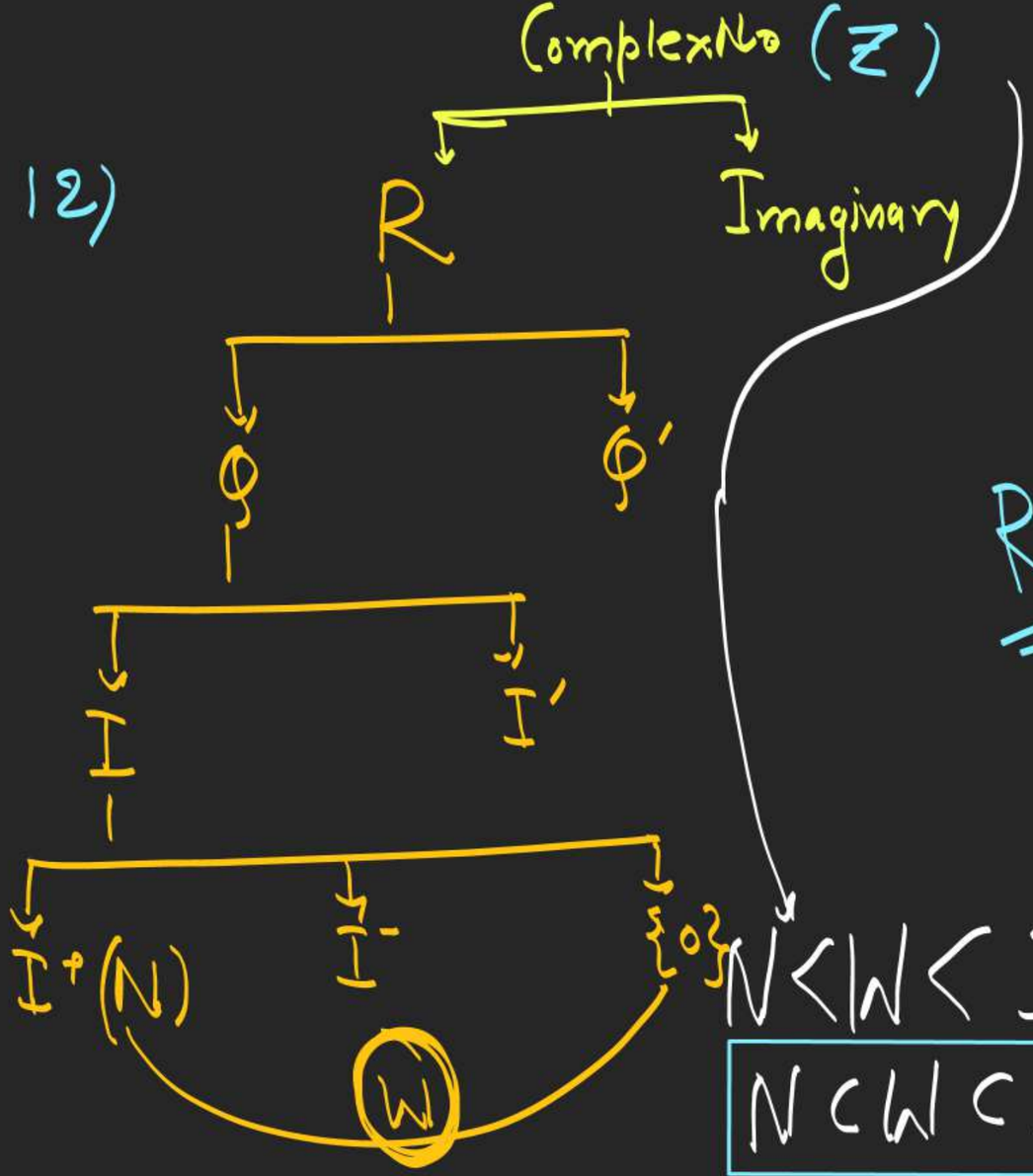
Fundamentals of Mathematics

12)



11th me Nya.

Q $x^2+1=0$ then $x=?$

$x^2 = -1$

(+) -ve

(Not Possible)

(No Real Answer of x)

Rtt

$x = \pm\sqrt{-1}$

$x = \pm i$ => i is IOTA

$N < W < I < Q < R < Z$

$N \subset W \subset I \subset Q \subset R \subset Z$

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Fundamentals of Mathematics

Q $x^2 - 4 = 0$ find x?

Yad

$x^2 = 4$

$x = \pm\sqrt{4}$

$x = \pm 2$

Q $x^3 - 8 = 0$ find x?

$x^3 = 8$

$x = \sqrt[3]{8}$ (No ± outside)

$x = (2^3)^{\frac{1}{3}}$

$x = 2$

Q $x^2 + 4 = 0$ find x?

$x^2 = -4$

$x = \pm\sqrt{-4}$

$x = \pm \sqrt{4} \times \sqrt{-1}$

$x = \pm 2i$

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Fundamentals of Mathematics

HCF & LCM

HCF = Highest Common Factor.

LCM = Least common Multiple.

3	3, 6, 9
2	1, 2, 3
3	1, 1, 3
	1, 1, 1

LCM = 3 × 2 × 3

HCF(2, 4, 8) = 2

LCM(2, 4, 8) = 8

LCM(3, 6, 9) = 18

Rk

$$HCF\left(\frac{a}{b}, \frac{c}{d}, \frac{e}{f}\right) = \frac{HCF(a, c, e)}{LCM(b, d, f)}$$

Q $HCF\left(\frac{2}{3}, \frac{4}{5}\right) = ? \Rightarrow \frac{HCF(2,4)}{LCM(3,5)} = \frac{2}{15}$

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Fundamentals of Mathematics

Rule: $LCM\left(\frac{a}{b}, \frac{c}{d}, \frac{e}{f}\right) = \frac{LCM(a,c,e)}{HCF(b,d,f)}$

Example: $LCM\left(\frac{2}{3}, \frac{4}{7}, \frac{3}{5}\right) = ?$

$$\frac{LCM(2,4,3)}{HCF(3,7,5)} = \frac{12}{1} = 12$$

Rule:

$LCM(\phi, \phi) = \phi$

$LCM(\phi, \phi') =$ Not Possible

$LCM(\phi', \phi') =$ Possible in Same Category.

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Fundamentals of Mathematics

Q $L(M(2, \pi)) = ?$

$L(M(2, \pi)) = 2\pi$ (Wrong)

$2 \rightarrow Q$, $\pi \rightarrow Q'$

Not Possible

Q $L(M(2, 2^2, 2^3, 2^5)) = ?$

$Q\ Q\ Q\ Q$ = PSBL

$= 2^5$

Q $L(M(2, \sqrt{3})) = ?$

$L(M(2, \sqrt{3})) = 2\sqrt{3}$ (Wrong)

$2 \rightarrow Q$, $\sqrt{3} \rightarrow Q'$ = Not PSBL

Q $L(M(\pi, \pi^2)) = ?$

$\pi \rightarrow Q'$, $\pi^2 \rightarrow Q'$

$L(M(\pi, \pi^2)) = \pi^2$ (Wrong)

Check → $\frac{\pi^2}{\pi} = \pi$, Non Integer; $\frac{\pi^2}{\pi^2} = 1$

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Fundamentals of Mathematics

Dino Answer Integer Ayenge.

To hi correct.

1) Repeat Kar K Ana.

2) Kal Thoda fast Challenge.

3) Bche hue Qs Kar Ana

DPP 2 Try.

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Fundamentals of Mathematics - I

Q. Express the following avoiding fractional or negative indices :

1. $3^{\frac{5}{7}} = (3^5)^{\frac{1}{7}} = (243)^{\frac{1}{7}}$

2. $x^{\frac{-3}{2}} = \frac{b}{x^{3/2}}$

3. $\frac{3}{x^{\frac{-4}{5}}} = 3 \cdot (x)^{\frac{4}{5}}$

4. $x^{\frac{-2}{5}} \times 3a^{\frac{-1}{2}}$

$= \frac{1}{x^{2/5}} \times \frac{3}{a^{1/2}}$

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Fundamentals of Mathematics - I

Q. Express the following avoiding fractional or negative indices :

5. $8m^{-2} \times m^{\frac{-2}{3}}$

6. $x^{\frac{-4}{5}} + 3a^{\frac{-5}{4}}$

7. $x^{\frac{-2}{5}} \div 2x^{\frac{-1}{2}}$

8. $\sqrt[5]{x} \div \sqrt[5]{x^{-4}}$

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Fundamentals of Mathematics - I

Q. Express the following avoiding fractional or negative indices :

9. $\sqrt[2m]{a^{-5}} \times \sqrt[m]{a^{8}}$

$(a^{-5})^{\frac{1}{2m}} \times (a^{8})^{\frac{1}{m}}$

$\left(\frac{1}{a^5}\right)^{\frac{1}{2m}} \times (a^{16})^{\frac{1}{2m}} = \left(\frac{a^{16}}{a^5}\right)^{\frac{1}{2m}}$

$(a^{11})^{\frac{1}{m}}$

10. $\sqrt[48]{x^6} \div \sqrt[28]{x^{-5}}$

$\frac{(x^6)^{\frac{1}{48}}}{(x^{-5})^{\frac{1}{28}}} = \frac{x^{\frac{6}{48}}}{x^{-\frac{5}{28}}} = (x)^{\frac{6}{48}+\frac{5}{28}}$

$\frac{1}{4}\left[\frac{42+60}{84}\right]$

$(x)^{\frac{51}{4\times 84}} = x^{\frac{51}{2\times 84}}$

11. $(\sqrt[3]{x})^7 = \left(x^{\frac{1}{3}}\right)^7 = (x^7)^{\frac{1}{3}}$

12. $(\sqrt[4]{a})^{-6}$

$\left(a^{\frac{1}{4}}\right)^{-6} = (a)^{-\frac{6}{4}}$

$= a^{-\frac{3}{2}} = \frac{1}{a^{\frac{3}{2}}}$

$\frac{1}{4}\times\left[\frac{6}{12}+\frac{5}{7}\right]$

Fundamentals of Mathematics - I

$\frac{1}{a^{-5/8}} = \frac{1}{(a^5)^{\frac{1}{8}}}$

Q. Express the following avoiding radical signs and negative indices :

13. $\frac{1}{\sqrt[3]{x^{-2}}} = \frac{1}{(x^{-2})^{\frac{1}{3}}} = (x^2)^{\frac{1}{3}}$

14. $\frac{1}{(\sqrt[5]{a})^{-2}} = \frac{1}{(a^{\frac{1}{5}})^{-2}} = (a^{\frac{1}{5}})^2$

$= (a^2)^{\frac{1}{5}}$

$= a^{\frac{2}{5}}$

15. $\sqrt[3]{x^4} \div (\sqrt[6]{x})^{-1}$

$\frac{(x^4)^{\frac{1}{3}}}{(x^{\frac{1}{6}})^{-1}} = (x^4)^{\frac{1}{3}} \times (x^{\frac{1}{6}})^1$

$= x^{\frac{4}{3}} \times x^{\frac{1}{6}}$

$= (x)^{\frac{4}{3}+\frac{1}{6}} = (x)^{\frac{8}{6}}$

$= (x^3)^{\frac{1}{2}}$

16. $\sqrt[4]{a^{-3}} \div (\sqrt[8]{a})^{-1}$

$\frac{(a^{-3})^{\frac{1}{4}}}{(a^{\frac{1}{8}})^{-1}} = \frac{a^{-\frac{3}{4}}}{a^{-\frac{1}{8}}}$

$= (a)^{-\frac{3}{4}+\frac{1}{8}} = (a)^{\frac{-5}{8}}$

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Fundamentals of Mathematics - I

Q. Express the following avoiding radical signs and negative indices :

17. $4^{\frac{-3}{2}} = \frac{1}{(4)^{3/2}} = \frac{1}{(4^3)^{\frac{1}{2}}} = \frac{1}{\sqrt{64}} = \frac{1}{8}$

18. $8^{\frac{2}{3}}$ Rad $= (8^2)^{\frac{1}{3}} = (64)^{\frac{1}{3}} = (4^3)^{\frac{1}{3}} = 4$

19. $9^{\frac{3}{2}} = (9^3)^{\frac{1}{2}} = (729)^{\frac{1}{2}} = (3^6)^{\frac{1}{2}} = 3^3 = 27$

$(3^2)^{\frac{3}{2}} = 3^3 = 27$

20. $16^{\frac{5}{4}}$ Rad $= (2^4)^{\frac{5}{4}} = 2^5 = 32$

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Fundamentals of Mathematics - I

Q. Express the following avoiding radical signs and negative indices :

21. $81^{\frac{-3}{4}}$

22. $\frac{1}{6^{-2}}$

23. $(125)^{\frac{-2}{3}} = \left(5^3\right)^{\frac{-2}{3}}$

$= 5^{-2} = \frac{1}{5^2} = \frac{1}{25}$

24. $\left(\frac{1}{27}\right)^{\frac{-4}{3}}$

Fundamentals of Mathematics - I

Q. Express the following avoiding radical signs and negative indices :

25. $\left(\frac{1}{216}\right)^{\frac{-2}{3}}$

26. Simplify $\frac{x^{m+2n} x^{3m-8n}}{x^{5m-6n}}$

$$= \frac{(x)^{m+2n} (x)^{3m-8n}}{(x)^{5m-6n}}$$

$$= (x)^{m+2n+3m-8n-5m+6n}$$

$$= (x)^{-m} = \frac{1}{(x)^m}$$