

Calculation का महत्त्व वेंच

Chapter-7

Type-3

$$\sqrt{200}$$

$$14.1421$$

$$1.41421 \checkmark$$

$$\sqrt{2}$$

☒ (a) 1.414

(b) 1.824

(c) 2.214

(d) 1.212

A

$$\sqrt{300}$$

17.32

1.732

$$\sqrt{3}$$

(a) 1.236

☒ (b) 1.732

(c) 2.244

(d) 1.984

$$\sqrt{5}$$

✓ **(a) 2.236**

(b) 2.436

(c) 3.345

(d) 2.021

$$\sqrt{500}$$

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२.२३६

$$\sqrt{2.25}$$

~~(a) 1.5~~

(b) 0.15

(c) 15

(d) 0.25

$$\begin{array}{r} \sqrt{1.19} \\ 1.09 \end{array} \quad \begin{array}{r} \sqrt{1.21} \\ 1.1 \end{array}$$

$$\sqrt{1.19} < 1.1$$

☒ (a) 1.09

(b) 1.41

(c) 1.21

(d) 1.01

(A)

$$\sqrt{7}$$

(a) 2.235

(b) 2.123

(c) 2.645

(d) 2.245

$$\sqrt{1020} \quad \sqrt{1024}$$

↓

3.2

$$\sqrt{10.2}$$

(a) 3.24

(b) 3.42

(c) 3.68

✓ ~~(d) 3.19~~

①

$$7\sqrt{2}$$

~~(a) 9.89~~

(b) 9.43

(c) 10.9

(d) 6

A

$$\sqrt{2} \approx 1.4$$

$$4\sqrt{3}$$

(a) 6.2

(b) 7.42

✓ (c) 6.928

(d) 8.928

©

$$2\sqrt{5}$$

(a) 6.42

✓ (b) 4.47

(c) 8.96

(d) 5.67

$$3\sqrt{6}$$

(a) 8.3

 (b) 7.34

(c) 9.34

(d) 4.34

$$\frac{1}{\sqrt{2}} = 0.7$$

$$\frac{1}{\sqrt{3}} \approx 0.6$$

$$\frac{5}{\sqrt{2}}$$

(a) 1.54

~~(b) 3.54~~

(c) 2.54

(d) 4.54

$$\sqrt{2} = 1.414$$

$$1.4$$

$$\sqrt{3} = 1.732$$

$$1.7$$

$$\frac{2}{\sqrt{3}}$$

(a) 2.864

(b) 1.154

(c) 2.234

(d) 3.765

$$\sqrt{2.89}$$

(a) 0.17

(b) 3.4

(c) 1.7

(d) 0.017

$$\sqrt{0.5}$$

(a) 0.4

☒ (b) 0.7

(c) 0.5

(d) 0.2

$$\sqrt{0.26}$$

(a) 0.81

(b) 0.41

✓ (c) 0.51

(d) 0.24

$\sqrt{\quad}$

$\sqrt{\quad \times 100}$

$\sqrt[3]{\quad}$

$\sqrt[3]{\quad \times 1000}$

$\sqrt[3]{0.008}$

$\sqrt[3]{8}$

(a) 0.5

☒ (b) 0.2

(c) 2

(d) 0.02

2

→ 0.2

$$\sqrt[3]{0.064}$$

 (a) 0.4

(b) 0.04

(c) 0.8

(d) 0.004

$$\sqrt[3]{0.350}$$

(a) 0.63

✓ (b) 0.704

(c) 0.8

(d) 0.9

$$\sqrt[3]{1.330}$$

(a) 1

(b) 11

(c) 0.11

 (d) 1.1

$$\sqrt[3]{0.008}$$

(a) 40

(b) 0.2

(c) 0.4

(d) 4

$$\underline{0.4} \sqrt[3]{\underline{0.001}}$$

(a) 0.4

(b) 40

(c) 4

✓ (d) 0.04

$$\sqrt[3]{0.125} \times \sqrt{2.25}$$

~~(a) 0.75~~

(b) 2.5

(c) 7.5

(d) 75

0.5 x 1.5

$$\sqrt[3]{1.331} \times \sqrt{0.25}$$

☒ (a) 0.55 *$1\frac{1}{4} \times 0.5$*

(b) 5.5

(c) 10.2

(d) 1.5

$$4 \times \sqrt[3]{0.064}$$

~~(a) 1.6~~

(b) 0.32

(c) 0.16

(d) 3.2

$$5 \times \sqrt[3]{0.216}$$

☒ (a) 3

(b) 6

(c) 0.3

(d) 0.6

$$6 \times \sqrt{6.25}$$

☒ (a) 15

(b) 1.5

(c) 30

(d) 3

$$\sqrt[3]{0.216} \times \sqrt{0.25}$$

(a) 0.003

(b) 0.03

~~(c) 0.3~~

(d) 3

$$\sqrt[3]{0.729} \times \sqrt{0.81}$$

☒ (a) 0.81

(b) 1.6

(c) 0.36

(d) 8.1

$$\sqrt[3]{0.026} \times \sqrt{2.89}$$

(a) 1.7 0.3×1.7

(b) 0.89

☒ (c) 0.51

(d) 3.4

$$\sqrt{9.6} \times \sqrt[3]{0.008}$$

(a) 4.2

(b) 0.24

☒ (c) 0.62

(d) 1.02

$$\sqrt{10.2} \times \sqrt[3]{1.330}$$

3.2×1.1
(a) 5.36

☒ (b) 3.51

(c) 4.25

(d) 3.81

$$\sqrt{2} \times \sqrt[3]{0.216}$$

(a) 0.36

(b) 1.2

(c) 0.72

 (d) 0.84

$$2\sqrt{2} \times \sqrt[3]{1.729}$$

(a) 3.4

(b) 3.8

(c) 4.3

(d) 8.1

2.8×1.2

(A)

Surds and Indices (करणी एवं घातांक)

Monday

• Surds में Cube Root का अनोखा Pattern

$(a+b)^3 = \underbrace{a^3 + 3ab^2}_{\text{Number}} + \underbrace{b^3 + 3a^2b}_{\text{Root}}$

$\sqrt[3]{38+17\sqrt{5}}$

$\sqrt[3]{27+45}$ ✓
~~(A) $3+\sqrt{5}$~~

$\sqrt[3]{8+30}$ ✓
~~(B) $2+\sqrt{5}$~~

(C) $3+\sqrt{3}$
 (D) $2.5+\sqrt{5}$

$a \downarrow N$ $b \downarrow \sqrt{}$
 (B)

• Surds में Approximation का कमाल

$$\sqrt[3]{0.5} \approx 0.8$$

$$\sqrt{729} \quad \sqrt{756}$$

↓
27 →

$$\left(27 + \sqrt{756}\right)^{1/3} + \left(27 - \sqrt{756}\right)^{1/3} = ?$$

$$(27 + 27.5)^{1/3} + (27 - 27.5)^{1/3}$$

$$(54.5)^{1/3} - (0.5)^{1/3}$$

$$3.8 - 0.8 \approx 3$$

$$\begin{array}{r} 27 \quad 54.5 \\ 3^3 \quad \downarrow \\ 27 \quad 43 \end{array}$$

~~(A) 3~~

(B) 9

(C) 18

(D) 27

(A)

- **Surds में Approximation का कमाल**

$$\sqrt[3]{26 + 15\sqrt{3}} + \sqrt[3]{26 - 15\sqrt{3}} = ?$$

15×1.7

$$\begin{array}{l} \sqrt[3]{26 + 25.5} \quad + \sqrt[3]{26 - 25.5} \\ \sqrt[3]{51.5} \quad + \sqrt[3]{0.5} \\ 3.6 \quad + 0.8 \end{array}$$

- (A) 6
(B) 5
(C) 4
(D) 3
- (C)**

- Algebra से Co-relate करके सीधा Answer कैसे निकालें

$$\sqrt{6} + \sqrt{12} - \sqrt{24} - \sqrt{8} = ?$$

$$(a+b+c)^2 = \underbrace{a^2+b^2+c^2}_{\text{Number}} + \underbrace{2ab+2bc+2ca}_{\text{Root}}$$

①

~~$$\text{A} \begin{matrix} a & b & c \\ (1+\sqrt{3}+\sqrt{2})^2 \end{matrix}$$~~

~~$$\text{B} (\sqrt{2}-\sqrt{3}+\sqrt{6})^2$$~~

~~$$\text{C} (-1+\sqrt{3}+\sqrt{2})^2$$~~

$$\text{D} (1+\sqrt{3}-\sqrt{2})^2$$

- Algebra से Co-relate करके सीधा Answer कैसे निकालें

$$\sqrt{1+2019}\sqrt{1+2020}\sqrt{1+2021 \times 2023} = ?$$

$$(x-1) \quad x \quad (x+1)$$

$$\sqrt{1+x^2-1}$$

$$\sqrt{1+2020 \times 2022}$$

$$\sqrt{1+2019 \times 2021}$$

- ☒ (A) 2020
- (B) 2021
- (C) 2023
- (D) 2018

- **Smallest/Greatest का खेल**

Type – 1 (जब $\sqrt{\quad}$ में हो और सभी Brackets के No. का Sum equal हो)

$$x = (\sqrt{33} + \sqrt{11}), y = (\sqrt{15} + \sqrt{29}), z = (\sqrt{41} + \sqrt{3}), t = (\sqrt{21} + \sqrt{23})$$

Sum same
Product ✓

, Arrange in descending order (घटते क्रम में)

44
363

44
435

44
123

44
483

$t > y > x > z$

- **Smallest/Greatest का खेल**

Type – 1 (जब $\sqrt{\quad}$ में हो और सभी Brackets के No. का Sum equal हो)

Write in Descending order (घटते क्रम में)

$$\left(\underbrace{\sqrt{3} + \sqrt{8}}_{24}\right), \left(\underbrace{\sqrt{5} + \sqrt{6}}_{30}\right), \left(\underbrace{\sqrt{1} + \sqrt{10}}_{10}\right), \left(\underbrace{\sqrt{4} + \sqrt{7}}_{28}\right)$$

$$\sqrt{5} + \sqrt{6} > \sqrt{4} + \sqrt{7} > \sqrt{3} + \sqrt{8} > \sqrt{1} + \sqrt{10}$$

Type - 2 (जब $\sqrt{\quad}$ में हो और सभी Brackets के No. का Product equal हो)

1. $x = (\sqrt{18} + \sqrt{10}), y = (\sqrt{36} + \sqrt{5})$

$$z = \sqrt{20} + \sqrt{9}, t = \sqrt{45} + \sqrt{4}$$

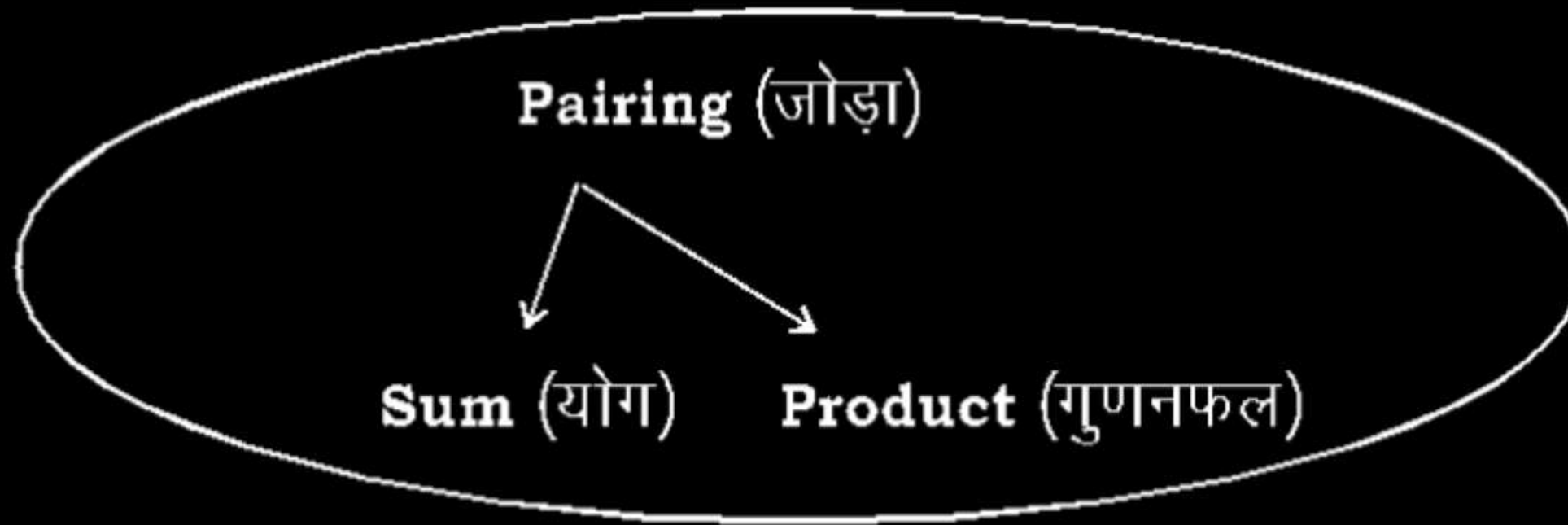
Product same

Sum ✓

$$t > y > z > x$$

$$(\sqrt{a} + \sqrt{b})^2 = \underbrace{a+b}_{\text{Sum}} + 2\underbrace{\sqrt{ab}}_{\text{Product}}$$

- **Pairing का खतरनाक खेल**



- ☞ यहाँ **pairing** करते हुए देखते हैं या तो दो **Number** का **Product/Sum same** हो।
- ☞ यदि **Product same** है, तो **Number** का **Sum** करेंगे।

Ex.: $\left[(\sqrt{6} - \sqrt{10}) - (\sqrt{21} - \sqrt{35}) \right] \times \left[(\sqrt{6} + \sqrt{10}) + (\sqrt{21} + \sqrt{35}) \right] = ?$

Soln: $\left[\left(\sqrt{6} - \sqrt{10} \right) - \left(\sqrt{21} - \sqrt{35} \right) \right] \times \left[\left(\sqrt{6} + \sqrt{10} \right) + \left(\sqrt{21} + \sqrt{35} \right) \right]$



$$(35 + 6) - (21 + 10)$$

$$\Rightarrow \textcircled{10} \text{ Ans}$$

- ☞ चूँकि 35 और 6 अंक इसलिए रखा है क्योंकि दोनों जगह इनके sign same हैं।
- ☞ 21 और 10 पीछे रखा है क्योंकि sign change हो रहे है।

$$\left[\left(\sqrt{6} - \sqrt{10} \right) - \left(\sqrt{21} - \sqrt{35} \right) \right] \times \left[\left(\sqrt{6} + \sqrt{10} \right) + \left(\sqrt{21} + \sqrt{35} \right) \right] = ?$$

$$\left[(\sqrt{35} + \sqrt{6}) - (\sqrt{21} + \sqrt{10}) \right] \left[(\sqrt{35} + \sqrt{6}) + (\sqrt{21} + \sqrt{10}) \right]$$

$$(\sqrt{35} + \sqrt{6})^2 - (\sqrt{21} + \sqrt{10})^2$$

$$(35+6) - (21+10) \checkmark$$

10 Ans

$$(35+6) - (21+10) \checkmark$$

- Rationalising Factor (परिमेयकरण गुणनखंड)
-

$\sqrt[3]{5}$ का rationalising factor क्या होगा ?

$$\sqrt[3]{5} \times \sqrt[3]{5^2}$$

→ $\sqrt[3]{25}$ Ans

- Rationalising Factor (परिमेयकरण गुणनखंड)
-

$\sqrt[4]{a^3b^2c}$ का rationalising factor क्या होगा ?

$\sqrt[4]{a^1b^2c^3}$ Ans

- Rationalising Factor (परिमेयकरण गुणनखंड)

Find rationalising factor of $\sqrt[3]{16} - \sqrt[3]{4} + 1$.

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$\left((\sqrt[3]{4})^2 - \underset{\substack{\uparrow \\ a}}{\sqrt[3]{4}} \times \underset{\substack{\uparrow \\ b}}{1} + 1^2 \right)$$

$$\left(\sqrt[3]{4} + 1 \right)$$

$\sqrt[3]{4} + 1$ Ans

- Rationalising Factor (परिमेयकरण गुणनखंड)

Rationalising factor of $2^{\frac{1}{3}} + 2^{\frac{-1}{3}}$ is:

$$a + b$$

$$a^3 + b^3$$
$$2 + \frac{1}{2}$$

$$(a+b)(a^2-ab+b^2)$$

$$2^{\frac{1}{3}} - 1 + 2^{\frac{2}{3}}$$

Ans