

QURDS AND INDICES

Q) $(\sqrt{5}+\sqrt{4})$, $(\sqrt{7}+\sqrt{2})$, $(\sqrt{6}+\sqrt{3})$ find the value of largest and smallest number.

$(\sqrt{5}+\sqrt{4})$, $(\sqrt{7}+\sqrt{2})$, $(\sqrt{6}+\sqrt{3})$ सबसे बड़ी और सबसे छोटी संख्या का मान ज्ञात करें।

$$\underbrace{(\sqrt{5}+\sqrt{4})}_{20}, \underbrace{(\sqrt{7}+\sqrt{2})}_{14}, \underbrace{(\sqrt{6}+\sqrt{3})}_{18}$$

$$\sqrt{5}+\sqrt{4}, \sqrt{7}+\sqrt{2}$$

Q) What is the value of $\frac{2\sqrt{10}}{\sqrt{5}+\sqrt{2}-\sqrt{7}} - \sqrt{\frac{5-2}{5+2}} - \frac{3}{\sqrt{7}-2}$

$$\frac{2\sqrt{10}}{\sqrt{5}+\sqrt{2}-\sqrt{7}} - \sqrt{\frac{5-2}{5+2}} - \frac{3}{\sqrt{7}-2} \text{ का मान क्या है ?}$$

$$\frac{2\sqrt{10}}{\sqrt{5}+\sqrt{2}-\sqrt{7}} \times \frac{\sqrt{5}+\sqrt{2}+\sqrt{7}}{\sqrt{5}+\sqrt{2}+\sqrt{7}} - \sqrt{\frac{5-2}{5+2} \times \frac{5-2}{5-2}} - \frac{3}{\sqrt{7}-2} \times \frac{\sqrt{7}+2}{\sqrt{7}+2}$$

$$\frac{2\sqrt{10}(\sqrt{5}+\sqrt{2}+\sqrt{7})}{(\sqrt{5}+\sqrt{2})^2 - (\sqrt{7})^2}$$

$$\sqrt{\frac{(5-2)^2}{5-4}}$$

$$\frac{\cancel{3}(\sqrt{7}+2)}{\cancel{7}-4}$$

$$\frac{2\sqrt{10}(\sqrt{5}+\sqrt{2}+\sqrt{7})}{\cancel{7} + 2\sqrt{10} - \cancel{7}}$$

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

$$(\sqrt{7}+2)$$

$$\sqrt{5}+\sqrt{2}+\sqrt{7} - \sqrt{5} + \cancel{2} - \sqrt{7} - \cancel{2}$$

$$= \sqrt{2}$$

TYPE-III

Q) $\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}} = (a+b) + (a-b)\sqrt{35}$ then find $(a-b)$

$$\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}} \times \frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}+\sqrt{5}}$$

$$\frac{(\sqrt{7}+\sqrt{5})^2}{7-5}$$

$$\frac{7+5+2\sqrt{35}}{2}$$

$$\frac{12+2\sqrt{35}}{2}$$

$$\frac{2(6+\sqrt{35})}{2} = 6+\sqrt{35}$$

$$a+1=6$$

$$\boxed{a=5}$$

$$a+b=1$$

$$5+b=1$$

$$\boxed{b=-4}$$

$$a-b$$

$$5-(-4)$$

$$=9$$

Q) $\frac{2+\sqrt{3}}{2-\sqrt{3}} = (a+b) + (b+1)\sqrt{3}$ find $a-b$

$$\frac{2+\sqrt{3}}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}}$$

$$\frac{(2+\sqrt{3})^2}{4-3}$$

$$4+3+4\sqrt{3}$$

$$(7+4\sqrt{3})$$

$$a+b=7$$

$$a+3=7$$

$$\boxed{a=4}$$

$$b+1=4$$

$$\boxed{b=3}$$

$$a-b$$

$$4-3$$

$$=1$$

TYPE-IV

$x = \sqrt{a\sqrt{a\sqrt{a\cdots}}} \text{ n बार}$

Ans: $a^{\frac{2^n-1}{2^n}}$

Q $\sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}$ (n=4)

$$\boxed{a=2}$$

$$2^{\frac{2^4-1}{2^4}} = 2^{\frac{16-1}{16}}$$

$$= 2^{\frac{15}{16}}$$

Q) $\sqrt{7\sqrt{7\sqrt{7\sqrt{7\sqrt{7}}}}}$ Simplify the / को सरल करें।

$$n=5$$

$$a=7$$

$$7^{\frac{2^5-1}{2^5}}$$

$$7^{\frac{32-1}{32}} = 7^{\frac{31}{32}}$$

$x = \sqrt{a\sqrt{a\sqrt{a\sqrt{a}}}} \dots \infty$

$$x = \sqrt{ax}$$

$$x^2 = ax$$

$$\boxed{x = a}$$

Q) $\sqrt{x\sqrt{x\sqrt{x\sqrt{x\sqrt{x}}}} \dots \infty = ?$

x

Q) $\sqrt[5]{5\sqrt{5\sqrt{5\sqrt{5\sqrt{5\sqrt{5}}}}}} \dots \infty ?$

5

Q) If $x^m = \sqrt[14]{x\sqrt{x\sqrt{x}}}$, then what is the value of m ?

यदि $x^m = \sqrt[14]{x\sqrt{x\sqrt{x}}}$ तो m का मान क्या है?

$$\frac{(x^m)^{14}}{x^{14m}} = \frac{x\sqrt{x\sqrt{x}}}{x\sqrt{x^1 x^{1/2}}}$$

$$x\sqrt{x^{3/2}}$$

$$x(x^{3/2})^{1/2}$$

$$x^1 \times x^{3/4}$$

$$x^{1+\frac{3}{4}}$$

$$\boxed{x^{7/4}}$$

$$x^{14m} = x^{7/4}$$

$$\frac{2 \times 14m}{4} = 1$$

$$m = \frac{1}{8}$$

$$\textcircled{Q} x = \sqrt[3]{a \sqrt{b \sqrt[3]{a \sqrt{b \sqrt[3]{a \sqrt{b \dots \infty}}}}} = ?$$

$$x = \sqrt[3]{a \sqrt{bx}}$$

$$x^3 = a \sqrt{bx}$$

$$(x^3)^2 = a^2 \times bx$$

$$x^6 = a^2 bx$$

$$x^5 = a^2 b$$

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

$$\textcircled{Q} \sqrt[3]{4 \sqrt[4]{2 \sqrt[3]{4 \sqrt[4]{2 \sqrt[3]{4 \dots \infty}}}}} = ?$$

$$(a^2 b)^{1/5}$$

$$(4^2 \times 2)^{1/5}$$

$$(32)^{1/5}$$

$$(2^5)^{1/5}$$

$$= 2$$

$$\textcircled{Q} \sqrt[3]{49 \sqrt[7]{7 \sqrt[3]{49 \sqrt[7]{7 \sqrt[3]{49 \dots \infty}}}}} = ?$$

$$(a^2 b)^{1/5}$$

$$(49^2 \times 7)^{1/5}$$

$$((7^2)^2 \times 7^1)^{1/5}$$

$$(7^4 \times 7^1)^{1/5}$$

$$(7^5)^{1/5}$$

$$= 7$$

$$\# \sqrt{a + \sqrt{a + \sqrt{a + \sqrt{a + \dots \infty}}}} = \frac{1 + \sqrt{1 + 4a}}{2}$$

$$\# \sqrt{a - \sqrt{a - \sqrt{a - \sqrt{a - \dots \infty}}}} = \frac{-1 + \sqrt{1 + 4a}}{2}$$

Q) $\sqrt{7 + \sqrt{7 + \sqrt{7 + \dots \infty}}}$

$$\frac{1 + \sqrt{1 + 4 \times 7}}{2}$$

$$\frac{1 + \sqrt{29}}{2}$$

Q) $\sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}}$ Find the value of $\sqrt{\quad}$ का मान ज्ञात करें।

$$\frac{1 + \sqrt{1 + 4a}}{2}$$

$$\frac{1 + \sqrt{1 + 4 \times 30}}{2} = \frac{1 + \sqrt{121}}{2}$$

$$\frac{1 + 11}{2} = \frac{12}{2} = 6$$

Ind

30
5 × 6
diff = 1

Ans 6

• ऐसी 2 संख्या से factorization करना है जिनका diff 1 हो।

• अगर बीच में (+) का sign है तो Ans बड़ी संख्या होगा और (-) का sign है तो Ans छोटी संख्या होगा।

Q) If $x^2 - 20 = \sqrt{20 + \sqrt{20 + \sqrt{20 + \sqrt{20 + \dots \infty}}}}$ Infinite terms then what is x equal to?

4 × 5

$$x^2 - 20 = 5$$

$$x^2 = 25$$

$$x = \sqrt{25}$$

$$= 5$$

Q) Find the value of the given expression.

दिए गए व्यंजक का मान ज्ञात कीजिए।

$$\sqrt{20 - \sqrt{20 - \sqrt{20 - \sqrt{20 - \dots \infty}}}}$$

4 × 5
4

Q) The value of $\sqrt{1+\sqrt{1+\sqrt{1+\dots}}}$ is
 $\sqrt{1+\sqrt{1+\sqrt{1+\dots}}}$ का मान है।

$$\frac{1+\sqrt{1+4 \times 1}}{2}$$

$$\frac{1+\sqrt{5}}{2}$$

$$\frac{1+2.2}{2}$$

$$\sim \frac{3.2}{2} = 1.6$$

1 और 2 के बीच है Lies between 1 and 2

Q) $\sqrt{42-\sqrt{42-\sqrt{42-\sqrt{42-\dots}}}} = ?$

⑥ $\times 7$

Ans = 6

Q) If $x = \sqrt{a+\sqrt{a+\sqrt{a+\sqrt{a+\dots}}}}$ and $y = \sqrt{8-\sqrt{8-\sqrt{8-\sqrt{8-\dots}}}}$
 then find $x-y$?

$$x = \frac{1+\sqrt{1+4a}}{2}$$

$$y = \frac{-1+\sqrt{1+4a}}{2}$$

$$x-y = \frac{1+\sqrt{1+4a}}{2} - \left[\frac{-1+\sqrt{1+4a}}{2} \right]$$

$$\frac{1+\sqrt{1+4a} + 1 - \sqrt{1+4a}}{2} = \frac{2}{2} = 1$$

Q) If $\sqrt{2\sqrt{4\sqrt{2\sqrt{4\sqrt{2}}}}} = 32^a$, then find the value of a
 यदि $\sqrt{2\sqrt{4\sqrt{2\sqrt{4\sqrt{2}}}}} = 32^a$, तो a का मान ज्ञात करें।

$$(2^5)^a$$

$$\boxed{2^{5a}}$$

$$2^2 \times 2^{1/2}$$

$$2 \left(2^{\frac{5}{2}} \right)^{1/2}$$

$$2^1 \times 2^{\frac{5}{4}}$$

$$2^2 \left(2^{9/4} \right)^{1/2}$$

$$2^2 \times 2^{9/8}$$

$$2^1 \left(2^{\frac{25}{8}} \right)^{1/2}$$

$$2^1 \times 2^{\frac{25}{16}}$$

$$\left(2^{\frac{41}{16}} \right)^{1/2}$$

$$\left(2^{\frac{41}{32}} \right) = 2^{5a}$$

$$5a = \frac{41}{32}$$

$$a = \frac{41}{160}$$

1. $\sqrt{5\sqrt{5\sqrt{5\sqrt{5}}}} = ?$

(a) $5^{\frac{1}{4}}$

(b) $5^{\frac{3}{4}}$

(c) $5^{\frac{7}{8}}$

(d) $5^{\frac{15}{16}}$

2. $\sqrt{7\sqrt{7\sqrt{7\sqrt{7\sqrt{7}}}}} \dots \infty = ?$

(a) 0

(b) $7^{\frac{1}{2}}$

(c) 7

(d) 1

3. $\sqrt{12 + \sqrt{12 + \sqrt{12 + \sqrt{12 + \dots \infty}}}} = ?$

(a) 4

(b) 2

(c) 3

(d) 8

4. Solve $(\sqrt{42 + \sqrt{42 + \sqrt{42 + \dots \infty}}}) \times (\sqrt{42 - \sqrt{42 - \sqrt{42 - \dots \infty}}})$

(a) 48

(b) 40

(c) 42

None of these

5. $\sqrt[3]{a^5 \sqrt{b^{10} \sqrt[3]{a^5 \sqrt{b^{10} \sqrt{a^5 \dots \infty}}}}} = ?$

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

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

(c) a^2b^2

(d) $(a^2b^2)^{\frac{1}{10}}$

6. $\sqrt{2 - \sqrt{2 - \sqrt{2 - \sqrt{2 - \sqrt{2 - \dots - \infty}}}}} = ?$

- (a) 2
(b) 0
(c) 1
(d) $2\sqrt{2}$

7. $\frac{\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}}{\sqrt[3]{8}} = ?$

- (a) 8
(b) 4
(c) $1/2$
(d) 2

8. $\sqrt{74 + \sqrt{700 \times \sqrt{42 + \sqrt{42 + \sqrt{42 \dots \dots \infty}}}}} = ?$

- (a) 11
(b) 12
(c) 10
(d) 13

9. $\frac{1}{\sqrt[3]{4} + \sqrt[3]{2} + 1} = a\sqrt[3]{4} + b \cdot \sqrt[3]{2} + c$, find $a + b + c$

- (a) 3
(b) 2
(c) 0
(d) 1

10. $\sqrt{12 + 2\sqrt{6} + 2\sqrt{21} + 2\sqrt{14}} = ?$

- (a) $(\sqrt{7} + \sqrt{3} + \sqrt{2})$
(b) $(\sqrt{5} + \sqrt{2} + \sqrt{1})$
(c) $(\sqrt{7} - \sqrt{3} + \sqrt{2})$
(d) $(\sqrt{5} - \sqrt{2} + \sqrt{1})$

11. $\left(\frac{m^2}{n^2}\right)^{4x+5} = \left(\frac{n^3}{m^3}\right)^{\frac{x}{3}+6}$ find $x = ?$

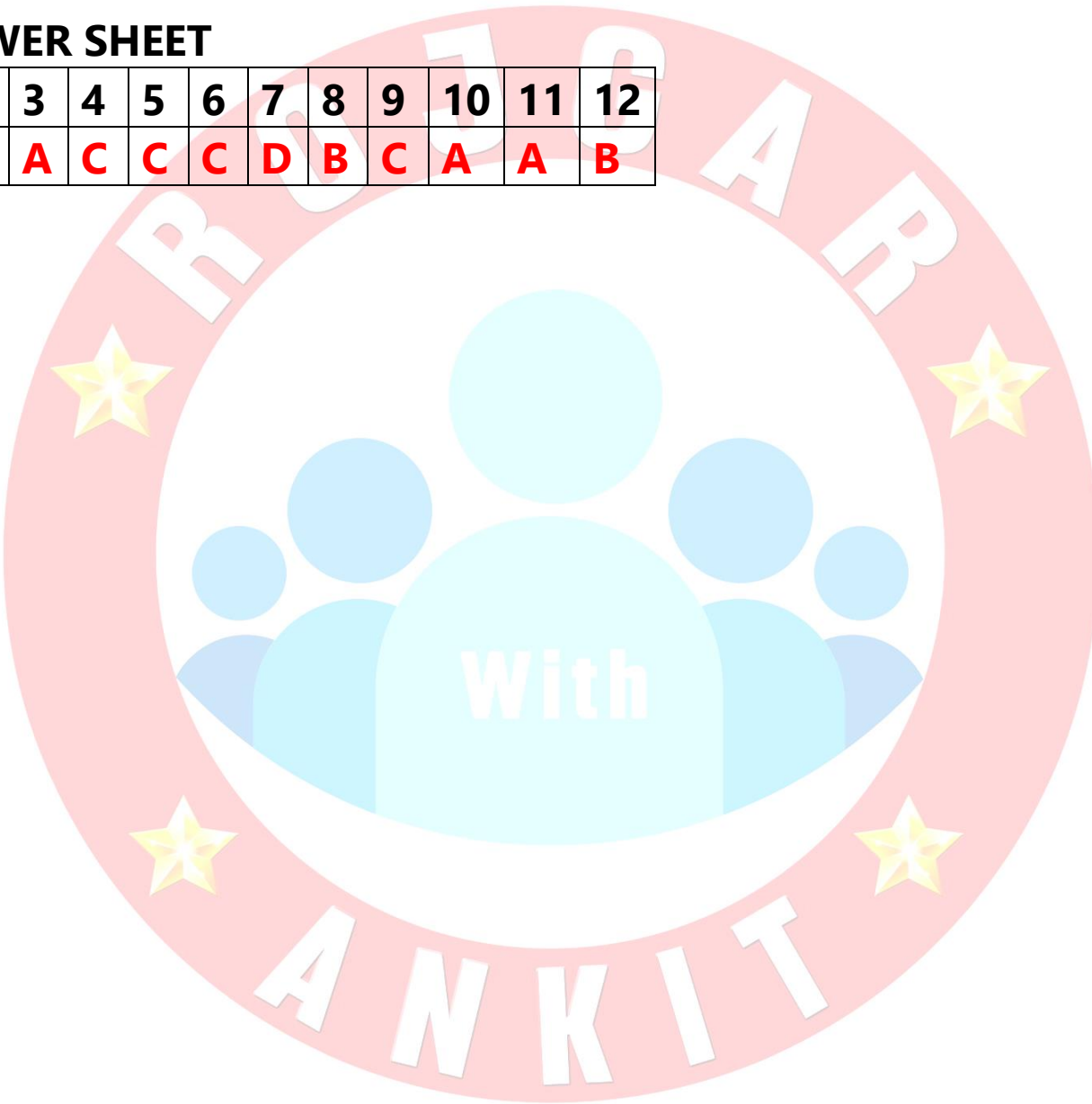
- (a) $\frac{-28}{9}$ (b) $\frac{-28}{7}$
(c) $\frac{28}{7}$ (d) $\frac{+28}{9}$

12. $\sqrt[4]{\sqrt[10]{\left[\sqrt[12]{\left(\sqrt[4]{3^2}\right)^6}\right]^8}}^5} = ?$

- (a) $\sqrt[3]{3}$
- (b) $\sqrt[4]{3}$
- (c) $\sqrt{3}$
- (d) 9

ANSWER SHEET

1	2	3	4	5	6	7	8	9	10	11	12
D	C	A	C	C	C	D	B	C	A	A	B



Sol 9

$$\frac{1}{\sqrt[3]{4} + \sqrt[3]{2} + 1} = a\sqrt[3]{4} + b\sqrt[3]{2} + c$$

$$= \sqrt[3]{2} - 1 = a\sqrt[3]{4} + b\sqrt[3]{2} + c$$

$$a = 0, b = 1, c = -1$$

$$\therefore a + b + c = 0 + 1 - 1 = 0$$

Sol 10

$$\sqrt{12 + 2\sqrt{6} + 2\sqrt{21} + 2\sqrt{14}}$$

$$= \sqrt{(\sqrt{7})^2 + (\sqrt{3})^2 + (\sqrt{2})^2 + 2\sqrt{3} \times \sqrt{2} + 2 \times \sqrt{7} \times \sqrt{3} + 2\sqrt{7} \times \sqrt{2}}$$

$$= \sqrt{7} + \sqrt{3} + \sqrt{2}$$

Sol 11

$$\left(\frac{m^2}{n^2}\right)^{4n+5} = \left(\frac{n^3}{m^3}\right)^{\frac{n}{3}+6}$$

$$\left(\frac{m}{n}\right)^{8n+10} = \left(\frac{n}{m}\right)^{-n-18}$$

$$8n+10 = -n-18$$

$$n = -\frac{28}{9}$$

Sol 12

$$4 \sqrt[10]{\left[2 \sqrt[12]{\left[4 \sqrt[3]{3^2}\right]^6}\right]^8}^5$$

$$= 3^{\left(\frac{2 \times 6 \times 8 \times 5}{4 \times 10 \times 12 \times 4}\right)} = 3^{\frac{1}{4}} = \sqrt[4]{3}$$