

## SURDS AND INDICES

Q) If  $\frac{4^n \times 4^8 - 4^{(n+1)}}{4 \times 4^{n+7}} = x$ , then find  $x \times 4^7$ ?

$$\frac{4^n \times 4^8 - 4^1 \times 4^n}{4 \times 4^7 \times 4^n} = x$$

$$\frac{4^n (4^8 - 4^1)}{4 \times 4^n} = x \times 4^7$$

$$\frac{4^1 (4^7 - 1)}{4} = x \times 4^7$$

$$(4^7 - 1)$$

Q) Given  $\sqrt{2} = 1.414$ . The value of  $\sqrt{8} + 2\sqrt{32} - 3\sqrt{128} + 4\sqrt{50}$  is

$$\sqrt{8} + 2\sqrt{32} - 3\sqrt{128} + 4\sqrt{50}$$

$$\sqrt{4 \times 2} \quad \sqrt{16 \times 2} \quad \sqrt{64 \times 2} \quad \sqrt{25 \times 2}$$

$$2\sqrt{2} + 8\sqrt{2} - 24\sqrt{2} + 20\sqrt{2}$$

$$\sqrt{2} (2 + 8 - 24 + 20)$$

$$= 6\sqrt{2}$$

$$6 \times 1.414 = 8.484$$

Q) If  $a, b$  are rational number and  $a\sqrt{2} + b\sqrt{3} = \sqrt{98} + \sqrt{108} - \sqrt{48} - \sqrt{72}$  then the values of  $a, b$  are respectively.

यदि  $a, b$  परिमेय संख्याएँ हैं और  $a\sqrt{2} + b\sqrt{3} = \sqrt{98} + \sqrt{108} - \sqrt{48} - \sqrt{72}$  है तो  $a, b$  के मान क्रमशः हैं।

$$\sqrt{98} + \sqrt{108} - \sqrt{48} - \sqrt{72}$$

$$\sqrt{49 \times 2} \quad \sqrt{36 \times 3} \quad \sqrt{16 \times 3} \quad \sqrt{36 \times 2}$$

$$7\sqrt{2} + 6\sqrt{3} - 4\sqrt{3} - 6\sqrt{2}$$

$$1\sqrt{2} + 2\sqrt{3} = a\sqrt{2} + b\sqrt{3}$$

On comparing  $a=1, b=2$

$$\# \left( \left( (a^m)^n \right)^o \right)^p = a^{m \times n \times o \times p}$$

Q)  $\left[ \left\{ \left( -\frac{1}{2} \right)^2 \right\}^{-2} \right]^{-1}$  is equal to / के बराबर है ।

$$\left( -\frac{1}{2} \right)^{2 \times (-2) \times (-1)}$$

$$\left( -\frac{1}{2} \right)^4 = +\frac{1}{16}$$

$$(-a)^{\text{odd}} = -(a)^{\text{odd}}$$

$$(-a)^{\text{even}} = +(a)^{\text{even}}$$

Q) The value of  $\sqrt[3]{0.000125}$  is  
 $\sqrt[3]{0.000125}$  का मान है

$$\left( \frac{125}{1000000} \right)^{1/3}$$

$$\left[ \frac{5^3}{100^3} \right]^{1/3}$$

$$\left[ \left( \frac{5}{100} \right)^3 \right]^{1/3} = \left( \frac{5}{100} \right)^{3 \times \frac{1}{3}}$$

$$\frac{5}{100} = 0.05$$

$$\frac{a^n}{b^n} = \left( \frac{a}{b} \right)^n$$

$$(a^m)^n = a^{m \times n}$$

Q)  $\sqrt{\sqrt[3]{0.004096}}$  is equal to.  
 $\sqrt{\sqrt[3]{0.004096}}$  का मान है

$$\left[ \left[ \frac{4096}{10000000} \right]^{1/3} \right]^{1/2}$$

$$\left[ \frac{4096}{10000000} \right]^{1/6}$$

$$\left( \frac{4^6}{10^6} \right)^{1/6} = \left[ \left( \frac{4}{10} \right)^6 \right]^{1/6}$$

$$\frac{4}{10} = 0.4$$

Q) Find the value of  $\sqrt{625} + \sqrt{\frac{625}{100}} + \sqrt{\frac{625}{10000}} + \sqrt{\frac{625}{1000000}}$

$\sqrt{625} + \sqrt{\frac{625}{100}} + \sqrt{\frac{625}{10000}} + \sqrt{\frac{625}{1000000}}$  का मान ज्ञात कीजिए ।

$$25 + \frac{25}{10} + \frac{25}{100} + \frac{25}{1000}$$

$$25 + 2.5 + 0.25 + 0.025$$

$$27.775$$

Q) Which of the following statement (s) is / are true

निम्नलिखित में से कौन - सा कथन सत्य है ।

I.  $\sqrt{64} + \sqrt{0.0064} + \sqrt{0.81} + \sqrt{0.0081} = 9.07$

II.  $\sqrt{0.0010201} + \sqrt{98.01} + \sqrt{0.25} = 11.51$

a Only I / केवल I

b Only II / केवल II

c Both I and II / I और II दोनों

d Neither I nor II / न तो I न ही II

I.  $\sqrt{64} + \sqrt{0.0064} + \sqrt{0.81} + \sqrt{0.0081} = 9.07$

$$8 + 0.08 + 0.9 + 0.09$$

$$\begin{array}{r} 0.08 \\ 0.9 \\ 0.09 \\ 8 + 1.07 \\ = 9.07 \end{array}$$

Only I

Q)  $6\sqrt{(27)^{-\frac{2}{3}} + (8)^{-\frac{2}{3}}}$  Simplify value of / का सरलीकरण मान है ।

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

$$6\sqrt{3^{-2} + 2^{-2}}$$

$$6\sqrt{\frac{1}{3^2} + \frac{1}{2^2}}$$

$$6\sqrt{\frac{1}{9} + \frac{1}{4}}$$

$$a^{-m} = \frac{1}{a^m}$$

यदि  $\sqrt{1 + \frac{x}{144}} = \frac{13}{12}$  तो  $x$  किसके बराबर होगा।

$$1 + \frac{x}{144} = \frac{169}{144}$$

$$1 + \frac{x}{144} = 1 + \frac{25}{144}$$

$$x = 25$$

$$\left[ \left( 2\frac{7}{9} \right)^{2\frac{1}{2}} \right]^{\frac{3}{5}} \text{ and / और } \left[ \left( 1\frac{2}{3} \right)^5 \right]^{\frac{3}{5}}$$

$$\left[ \left( 2\frac{7}{9} \right)^{2\frac{1}{2}} \right]^{\frac{3}{5}}$$

$$\left(\frac{25}{9}\right)^{\frac{5}{2} \times \frac{3}{2}}$$

$$\left[ \left( \frac{5}{3} \right)^2 \right]^{\frac{3}{2}}$$

$$\begin{array}{r} 125 \\ \hline 27 \end{array}$$

$$\left[\left(1\frac{2}{3}\right)^5\right]^{\frac{3}{5}}$$

$$\left(\frac{5}{3}\right)^5 \times \frac{3}{5}$$

$$\begin{array}{r} 125 \\ \hline 27 \end{array}$$

Both the expression are equal  
दोनों व्यंजक समान है।

## TYPE-II

- Q) Which one of the following is the least?  
निम्नलिखित में से कौन सा सबसे छोटा है ?

$$\sqrt{3}, \sqrt[3]{2}, \sqrt{2} \text{ and } \sqrt[3]{4}$$

|                                |                                |                                |                                |                   |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------|
| $(3)^{\frac{1}{2} \times 6^3}$ | $(2)^{\frac{1}{3} \times 6^2}$ | $(2)^{\frac{1}{2} \times 6^3}$ | $(4)^{\frac{1}{3} \times 6^2}$ | $LCM(2,3)$<br>= 6 |
| $3^3$                          | $2^2$                          | $2^3$                          | $4^2$                          |                   |
| 27                             | 4                              | 8                              | 16                             |                   |
|                                | $\hookrightarrow \sqrt[3]{2}$  |                                |                                |                   |

Ascending order आरोही क्रम

$$\sqrt[3]{2} < \sqrt{2} < \sqrt[3]{4} < \sqrt{3}$$

Descending order अवरोही क्रम

$$\sqrt{3} > \sqrt[3]{4} > \sqrt{2} > \sqrt[3]{2}$$

- Q) Which one of the following is the biggest?  
निम्नलिखित में से कौन सा सबसे बड़ा है

$$\sqrt[3]{4}, \sqrt[4]{6}, \sqrt[6]{15} \text{ and } \sqrt[12]{245}$$

|                                 |                                 |                                  |                                    |                         |
|---------------------------------|---------------------------------|----------------------------------|------------------------------------|-------------------------|
| $(4)^{\frac{1}{3} \times 12^4}$ | $(6)^{\frac{1}{4} \times 12^3}$ | $(15)^{\frac{1}{6} \times 12^2}$ | $(245)^{\frac{1}{12} \times 12^1}$ | $LCM(3,4,6,12)$<br>= 12 |
| $4^4$                           | $6^3$                           | $15^2$                           | $245^1$                            |                         |
| 256                             | 216                             | 225                              | 245                                |                         |
| $\hookrightarrow \sqrt[3]{4}$   |                                 |                                  |                                    |                         |

- Q) Arrange the following in ascending order  
निम्नलिखित को आरोही क्रम में व्यवस्थित करें

$$\sqrt[3]{9}, \sqrt[4]{20}, \sqrt[6]{25}$$

|                               |                                |                                |                      |
|-------------------------------|--------------------------------|--------------------------------|----------------------|
| $9^{\frac{1}{3} \times 12^4}$ | $20^{\frac{1}{4} \times 12^3}$ | $25^{\frac{1}{6} \times 12^2}$ | $LCM(3,4,6)$<br>= 12 |
| $9^4$                         | $20^3$                         | $25^2$                         |                      |
| $9^2 \times 9^2$              | $\downarrow$                   | $\downarrow$                   |                      |
| 81 × 81                       | 8000                           | 625                            |                      |
| 80 × 80                       |                                |                                |                      |
| 6400                          |                                |                                |                      |

$$\sqrt[6]{25} < \sqrt[3]{9} < \sqrt[4]{20}$$

Q) The greatest of the numbers  
 $(2.89)^{0.5}$ ,  $2 - (0.5)^2$ ,  $1 + \frac{0.5}{1 - \frac{1}{2}}$ ,  $\sqrt{3}$

सबसे बड़ी संख्या  $(2.89)^{0.5}$ ,  $2 - (0.5)^2$ ,  $1 + \frac{0.5}{1 - \frac{1}{2}}$ ,  $\sqrt{3}$  है।

$$[(1.7)^2]^{\frac{1}{2}}, (2 - \frac{1}{4}), 1 + \frac{0.5}{\frac{1}{2}}, 1.73$$

$$1.7, \frac{7}{4}, 1+1, 1.73$$

$$1.7, 1.75, 2, 1.73$$

$$\frac{1+0.5}{1-\frac{1}{2}}$$

Q) The smallest among the numbers is  
 संख्याओं में सबसे छोटी है।

$$2^{250}, 3^{150}, 5^{100} \text{ and } 4^{200}$$

$$\text{HCF}(250, 150, 100, 200)$$

$$\begin{array}{cccc} \textcircled{50} (5, 3, 2, 4) & & & \\ \frac{250}{50} & , & \frac{150}{50} & , & \frac{100}{50} & , & \frac{200}{50} \\ 2^5 & & 3^3 & & 5^2 & & 4^4 \\ 32 & & 27 & & 25 & & 256 \\ & & & & \textcircled{5^{100}} & & \end{array}$$

Q) The greatest number among  $2^{60}$ ,  $3^{48}$ ,  $4^{36}$  and  $5^{24}$   
 $2^{60}$ ,  $3^{48}$ ,  $4^{36}$  और  $5^{24}$  और में से सबसे बड़ी संख्या है।

$$\text{HCF}(60, 48, 36, 24)$$

$$\textcircled{12} (5, 4, 3, 2)$$

$$\begin{array}{cccc} \frac{60}{12} & , & \frac{48}{12} & , & \frac{36}{12} & , & \frac{24}{12} \\ 2^5 & & 3^4 & & 4^3 & & 5^2 \\ 32 & & 81 & & 64 & & 25 \\ & & \textcircled{3^{48}} & & & & \end{array}$$

Q)  $2^{60}, 3^{70}, 4^{50}, 5^{20}$  find the value of smallest<sup>and</sup> largest number.

$2^{60}, 3^{70}, 4^{50}, 5^{20}$  सबसे छोटी और सबसे बड़ी संख्या का मान ज्ञात कीजिए।

$$\text{HCF}(60, 70, 50, 20) = 10$$

$$\begin{array}{cccc} 2^6 & 3^7 & 4^5 & 5^2 \\ \downarrow & \downarrow & \downarrow & \downarrow \\ 64 & 2187 & 1024 & 25 \end{array}$$

$$\text{Smallest} = 5^{20}$$

$$\text{Largest} = 3^{70}$$

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

$$\frac{3-2}{\sqrt{3}+\sqrt{2}} = \frac{1}{\sqrt{3}+\sqrt{2}} \quad \begin{array}{l} \text{बड़ी} \\ \text{छोटी} \end{array}$$

$$\begin{array}{cc} 0.5 & 0.33 \\ \frac{1}{2} & \frac{1}{3} \\ \downarrow & \downarrow \\ \text{बड़ी} & \text{छोटी} \end{array}$$

- Reciprocal में अगर Numerator Same है तो जिसका Denominator छोटा होगा वो संख्या बड़ी होगी और जिसका Denominator बड़ा होगा वो संख्या छोटी होगी।

Q) Which is the greatest among इनमें से सबसे बड़ा कौन है ?

$$(\sqrt{19} - \sqrt{17}), (\sqrt{13} - \sqrt{11}), (\sqrt{7} - \sqrt{5}) \text{ and } (\sqrt{5} - \sqrt{3})$$

$$\begin{array}{ccccccc} \text{सबसे छोटी} & \left( \frac{2}{\sqrt{19}+\sqrt{17}} \right) & \frac{2}{\sqrt{13}+\sqrt{11}} & \frac{2}{\sqrt{7}+\sqrt{5}} & \left( \frac{2}{\sqrt{5}+\sqrt{3}} \right) & \text{सबसे बड़ी} \\ & \underline{36} & \underline{24} & \underline{12} & \underline{8} & \end{array}$$

$$\sqrt{5} - \sqrt{3}$$

- Minus (-) का sign है और diff. same है तो जिसका योग सबसे छोटा होगा वो संख्या सबसे बड़ी होगी।
- अगर (+) plus का sign है तो जिसका योग सबसे बड़ा वो संख्या सबसे बड़ी।

1. If  $\sqrt{6} = 2.45$ , then find the value of  $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ .

यदि  $\sqrt{6} = 2.45$  है, तो  $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$  का मान ज्ञात कीजिए।

- (a) 7.7
- (b) 9.9
- (c) 6.6
- (d) 8.78

2. The value of  $\sqrt{513 - \sqrt{144} - \sqrt{81} - \sqrt{64}}$  का मान क्या है?

- (a) 22
- (b) 21
- (c) 28
- (d) 19

3. Solve/ज्ञात कीजिए:

$$\sqrt{(261 - \sqrt{(35 - \sqrt{(95 + \sqrt{25}))})})}$$

- (a) 14
- (b) 15
- (c) 16
- (d) 24

4. If  $\left[ \left\{ \left( \frac{2}{3} \right)^3 \right\}^{(2x+3)} \right]^{\frac{-3}{4}} = \left[ \left\{ \left( \frac{2}{3} \right)^{\frac{2}{3}} \right\}^{3x+7} \right]^{\frac{-6}{5}}$ , then find the value of  $\sqrt{2 - 42x}$

यदि  $\left[ \left\{ \left( \frac{2}{3} \right)^3 \right\}^{(2x+3)} \right]^{\frac{-3}{4}} = \left[ \left\{ \left( \frac{2}{3} \right)^{\frac{2}{3}} \right\}^{3x+7} \right]^{\frac{-6}{5}}$  है, तो  $\sqrt{2 - 42x}$  का मान ज्ञात

कीजिए।

- (a) 5
- (b) 6
- (c) 3
- (d) 4

5. The value of  $\sqrt[4]{\sqrt{100000000}} - \sqrt[3]{9261}$

$\sqrt[4]{\sqrt[4]{1000000000}} - \sqrt[3]{9261}$  का मान ज्ञात करें।

- (a) -14
- (b) -11
- (c) -51
- (d) -19

6. The value of  $[(\sqrt{529}) + (\sqrt{5.29}) + (\sqrt{0.0529})]$  is:

$[(\sqrt{529}) + (\sqrt{5.29}) + (\sqrt{0.0529})]$  का मान क्या है?

- (a) 25.323
- (b) 25.53
- (c) 23.253
- (d) 23.53

7.  $\left[ 8 - \left( \frac{4^{\frac{9}{4}} \sqrt{2.2^2}}{2\sqrt{2^{-2}}} \right)^{\frac{1}{2}} \right]$  is equal to

- (a) 32
- (b) 8
- (c) 1
- (d) 0

8.  $\sqrt{\frac{(0.1)^2 + (0.01)^2 + (0.009)^2}{(0.01)^2 + (0.001)^2 + (0.0009)^2}} = ?$

- (a)  $10^2$
- (b) 10
- (c) 0.1
- (d) 0.01

9. Which is greatest number among  $\sqrt[3]{8}$ ,  $\sqrt[2]{4}$ ,  $\sqrt[6]{64}$  ?

$\sqrt[3]{8}$ ,  $\sqrt[2]{4}$ ,  $\sqrt[6]{64}$  में से सबसे बड़ी संख्या कौन-सी है?

- (a)  $\sqrt[3]{8}$
- (b)  $\sqrt[2]{4}$
- (c)  $\sqrt[6]{64}$
- (d) सभी बराबर हैं

10.  $\sqrt[4]{3}$ ,  $\sqrt[5]{4}$ ,  $\sqrt[10]{12}$ , 1 What is the smallest number in

$\sqrt[4]{3}, \sqrt[5]{4}, \sqrt[10]{12}, 1$  में सबसे छोटी संख्या कौन-सी है?

- (a) 1  
(b)  $\sqrt[4]{3}$   
(c)  $\sqrt[5]{4}$   
(d)  $\sqrt[10]{12}$

11.  $\sqrt{5} - \sqrt{3}, \sqrt{7} - \sqrt{5}, \sqrt{9} - \sqrt{7}, \sqrt{11} - \sqrt{9}$  largest number is

$\sqrt{5} - \sqrt{3}, \sqrt{7} - \sqrt{5}, \sqrt{9} - \sqrt{7}, \sqrt{11} - \sqrt{9}$  सबसे बड़ी संख्या है

- (a)  $\sqrt{5} - \sqrt{3}$   
(b)  $\sqrt{7} - \sqrt{5}$   
(c)  $\sqrt{9} - \sqrt{7}$   
(d)  $\sqrt{11} - \sqrt{9}$

12.  $(\sqrt{8} + \sqrt{5}), (\sqrt{7} + \sqrt{6}), (\sqrt{10} + \sqrt{3}), (\sqrt{11} + \sqrt{12})$  who is smallest number

$(\sqrt{8} + \sqrt{5}), (\sqrt{7} + \sqrt{6}), (\sqrt{10} + \sqrt{3}), (\sqrt{11} + \sqrt{12})$  सबसे छोटी संख्या कौन है?

- (a)  $\sqrt{8} + \sqrt{5}$   
(b)  $\sqrt{7} + \sqrt{6}$   
(c)  $\sqrt{10} + \sqrt{3}$   
(d)  $\sqrt{11} + \sqrt{12}$

### ANSWER SHEET

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

# Worksheet solution

**Sol 1**

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

$$= \frac{5 + 2\sqrt{6}}{1}$$

$$= 5 + 4 \cdot 9 = 41$$

**Sol 2**

$$\sqrt{513 - \sqrt{144} - \sqrt{81} - \sqrt{64}}$$

$$\sqrt{513 - 12 - 9 - 8}$$

$$\sqrt{484} = 22$$

**Sol 3**

$$\sqrt{\left(261 - \sqrt{\left(35 - \sqrt{\left(95 + \sqrt{25}\right)}\right)}\right)}$$

$$= \sqrt{\left(261 - \sqrt{\left(35 - \sqrt{100}\right)}\right)}$$

$$= \sqrt{\left(261 - \sqrt{25}\right)}$$

$$= \sqrt{261 - 5} = \sqrt{256}$$

$$= 16$$

**Sol 4**

$$\left[\left(\frac{2}{3}\right)^{2n+3}\right]^{\frac{-3}{4}} = \left[\left(\frac{2}{3}\right)^{\frac{2}{3} \cdot 3n+7}\right]^{\frac{-6}{5}}$$

$$\left[\left(\frac{2}{3}\right)^{6n+9}\right]^{\frac{3}{4}} = \left[\left(\frac{2}{3}\right)^{2n+\frac{2}{3} \times 7}\right]^{\frac{6}{5}}$$

$$\left(2n + \frac{14}{3}\right) \frac{6}{5} = (6n+9) \times \frac{3}{4}$$

$$\frac{12n}{5} + \frac{28}{5} = \frac{9n}{2} + \frac{27}{4}$$

$$\frac{12n}{5} - \frac{9n}{2} = \frac{27}{4} - \frac{28}{5}$$

$$\frac{24n - 45n}{10} = \frac{135 - 112}{20}$$

$$-42n = 23$$

$$n = -\frac{23}{42}$$

$$\therefore \sqrt{2 - 42 \times \frac{-23}{42}}$$

$$= \sqrt{2 + 23} = 5$$

**Sol 5**

$$= \sqrt[4]{\sqrt{10000000000} - \sqrt{9261}}$$

$$= \sqrt{100} - 21$$

$$= 10 - 21 = -11$$

Sol 6

$$[(\sqrt{529} + (\sqrt{5.29}) + (\sqrt{0.0529}))]$$

$$= 23 + 2 \cdot 3 + 0.23$$

Sol 7

$$8 - \left[ \frac{4^{\frac{9}{4}} \sqrt{2 \cdot 2^2}}{2 \sqrt{2^{-2}}} \right]^{\frac{1}{2}}$$

$$= 8 - \left[ \frac{2^{\frac{9}{2}} \times 2^{\frac{3}{2}}}{1} \right]^{\frac{1}{2}}$$

$$= 8 - \left[ \frac{2^6}{1} \right]^{\frac{1}{2}}$$

$$= 8 - 8 = 0$$

Sol 8

$$\sqrt{\frac{(0.1)^2 + (0.01)^2 + (0.009)^2}{(0.01)^2 + (0.001)^2 + (0.009)^2}}$$

$$= \sqrt{\frac{100 \times [(0.1)^2 + (0.01)^2 + (0.009)^2]}{(0.1)^2 + (0.01)^2 + (0.009)^2}}$$

$$= \sqrt{100} = 10$$

Sol 9

$$= 3\sqrt{8}, 2\sqrt{4}, 6\sqrt{64}$$

$$= 8^{\frac{1}{2}}, 4^{\frac{1}{2}}, 64^{\frac{1}{6}}$$

$$= 2, 2, 2$$

अतः सभी संख्याएँ 2

Sol 10

$$4\sqrt{3}, 5\sqrt{4}, 10\sqrt{12}, 1$$

$$= 3^{\frac{1}{4} \times 20}, 4^{\frac{1}{5} \times 20}, 12^{\frac{1}{10} \times 20}, 1$$

$$= 3^5, 4^4, 12^2, 1$$

Sol 11

$$(\sqrt{5} - \sqrt{3}), (\sqrt{7} - \sqrt{5})$$

$$(\sqrt{9} - \sqrt{7}), (\sqrt{11} - \sqrt{9})$$

$$(\sqrt{5} - \sqrt{3})_{\text{Ans}}$$

Note - जहाँ अंश समान हो, वहाँ अंश छोटी संख्या ही छोटी मानेगी।

Sol 12

$$(\sqrt{8} + \sqrt{15})^2 = 13 + 2\sqrt{40}$$

$$(\sqrt{7} + \sqrt{6})^2 = 13 + 2\sqrt{42}$$

$$(\sqrt{10} + \sqrt{3})^2 = 13 + 2\sqrt{30}$$

$$(\sqrt{11} + \sqrt{12})^2 = 23 + 2\sqrt{132}$$