

74. What is the value of $\sqrt{2 + \sqrt{2 + \sqrt{2 + \dots}}}$?

$\sqrt{2 + \textcircled{1}\sqrt{2 + \sqrt{\textcircled{2} + \dots}}}$ का मान क्या है?

(A) 2

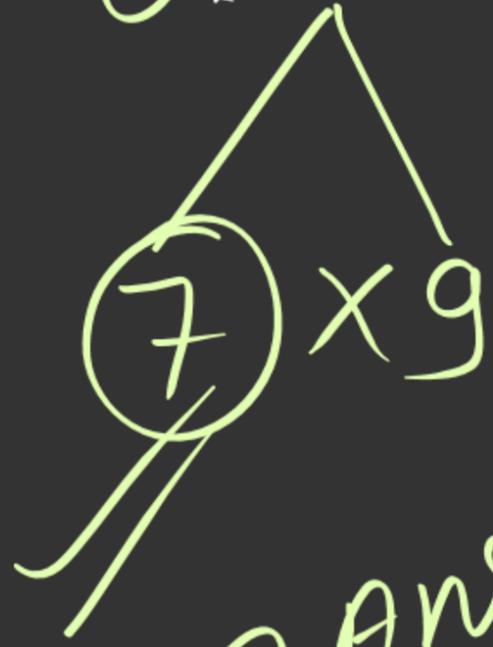
(C) $2\sqrt{2}$

(B) $\sqrt{2}$

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

2×1
2 ✓

$$\sqrt{63 - 2\sqrt{63 - 2\sqrt{63 - 2\sqrt{63 - \dots}}}} \dots \infty$$



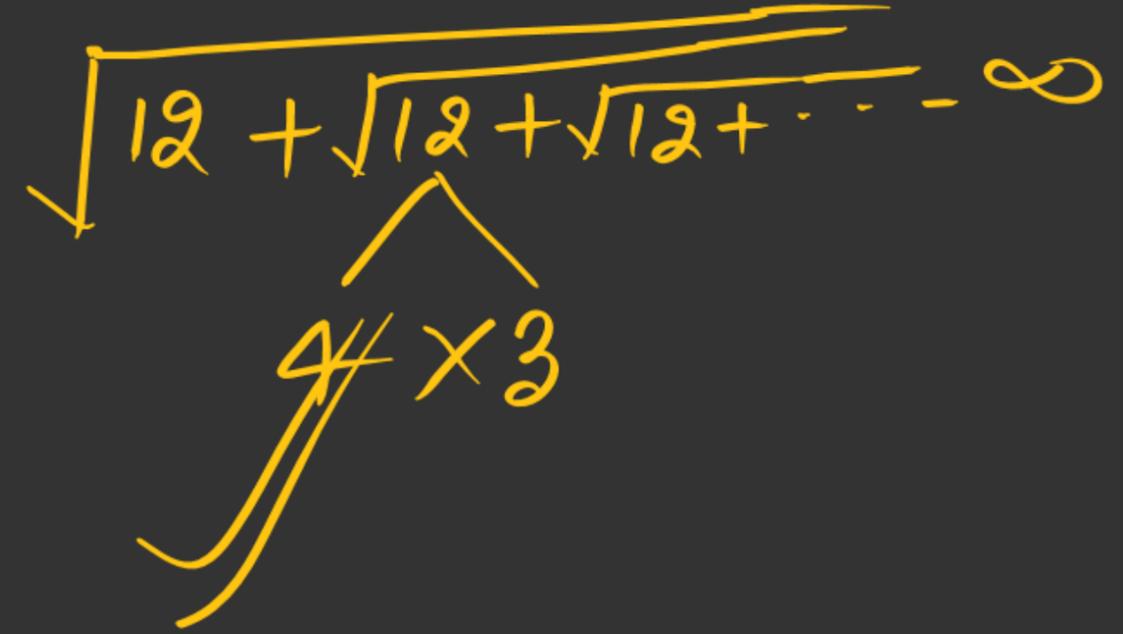
7 Ans.

① $x = \sqrt{a + \sqrt{a + \sqrt{a + \sqrt{a + \dots}}}} \dots \infty$

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

② $y = \sqrt{a - \sqrt{a - \sqrt{a - \sqrt{a - \dots}}}} \dots \infty$

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



$$x = \sqrt{7 + \sqrt{7 + \sqrt{7 + \sqrt{7 + \dots}}}} \dots \infty$$

$$\frac{\sqrt{4 \times 7 + 1} + 1}{2} = \frac{\sqrt{29} + 1}{2}$$

75. The value of $\sqrt{134 + \sqrt{94 + \sqrt{28 + \sqrt{54 + \sqrt{100}}}}}$ is?

$\sqrt{134 + 10} \sqrt{94 + 6} \sqrt{28 + 8} \sqrt{54 + 10} \sqrt{100}$ का मान है?

$\sqrt{100}$
 $\sqrt{36}$
 $\sqrt{64}$

(A) 13

(B) 15

(C) 12

(D) 17

$\sqrt{144}$

77. The value of $\sqrt{4 + \sqrt{44 + \sqrt{10000}}}$ is?

$\sqrt{4 + 12} \sqrt{44 + 100} \sqrt{10000}$ का मान है?

(A) 12

(B) 8

~~(C) 4~~

(D) -4

$$\sqrt{144} = 12$$

$$\sqrt{16} = 4$$

78. The simplified value of $\left(16^{\frac{3}{2}} + 16^{-\frac{3}{2}} \right)$ is.

$$\left(16^{\frac{3}{2}} + 16^{-\frac{3}{2}} \right)$$

का सरलीकृत मान है?

(A) 0

(B) $\frac{4097}{64}$

(C) 1

(D) $\frac{16}{4097}$

$$x^{-n} = \frac{1}{x^n}$$

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

$$16^{\frac{3}{2}} + \left(\frac{1}{16}\right)^{\frac{3}{2}}$$

$$(4^2)^{\frac{3}{2}} + \left(\frac{1}{4}\right)^{2 \times \frac{3}{2}}$$

$$4^3 + \left(\frac{1}{4}\right)^3$$

$$64 + \frac{1}{64} =$$

$$\frac{64 \times 64 + 1}{64} = \frac{4097}{64}$$

$$16 \times 4^2$$

79. If $\sqrt{2^n} = 64$, then $n = ?$

यदि $\sqrt{2^n} = 64$ हो, तो $n = ?$

(A) 2

(B) 6

(C) 4

~~(D) 12~~

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

$$\begin{aligned}\sqrt{2^n} &= (2^n)^{\frac{1}{2}} \\ &= 2^{\frac{n}{2}}\end{aligned}$$

$$\sqrt{2^n} = 64$$

$$2^{\frac{n}{2}} = 2^6$$

$$\frac{n}{2} = 6$$

$$n = 12$$

$$\begin{aligned}\sqrt{x} &= x^{\frac{1}{2}} \\ \sqrt{x^n} &= x^{\frac{n}{2}}\end{aligned}$$

$$\begin{aligned}a^x &= a^y \\ x &= y\end{aligned}$$

80. If $3^{x+8} = 27^{2x+1}$ find out the value of x .

यदि $3^{x+8} = 27^{2x+1}$ तब x का मान ज्ञात करें।

(A) 3

(B) -2

(C) -7

~~(D) 1~~

$$3^{x+8} = 3^{6x+3}$$

$$x+8 = 6x+3$$

$$5 = 5x$$

$$x=1$$

81. If $\sqrt{24} = 4.898$, the value of $\sqrt{\frac{8}{3}}$ is ?

यदि $\sqrt{24} = 4.898$ हो, तो

$\sqrt{\frac{8 \times 3}{3 \times 3}}$ का मान है?

$$\frac{\sqrt{24}}{3} = \frac{4.898}{3} = 1.633$$

~~(A) 1.633~~

(B) 0.544

(C) 1.333

(D) 2.666

82. Which of the following is the smallest?

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

निम्न में से कौन-सा सबसे छोटा है?

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

(A) $\sqrt{2}$

~~(B) $\sqrt[3]{2}$~~

(C) $\sqrt[3]{4}$

(D) $\sqrt{3}$

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

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

$$2^{\frac{1}{3}}, 2^{\frac{1}{2}}, 4^{\frac{1}{3}}$$

$$3^3$$

$$2^2, 2^3, 4^2$$

$$27$$

$$4$$

$$8$$

$$16$$

बड़ी हो

बड़ी हो

83. Which of the following is the greatest?

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

निम्न में कौन-सा सबसे बड़ा है?

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

(A) $\sqrt[4]{3}$

(C) $\sqrt[4]{2}$

~~(B) $\sqrt[3]{4}$~~

(D) $\sqrt{2}$

$$3, 2, 4 \xrightarrow{\text{LCM}} 12$$

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

$$4^{\frac{1}{3}}, 2^{\frac{1}{2}}, 3^{\frac{1}{4}}, 2^{\frac{1}{4}}$$

$$4^4, 2^6, 3^3, 2^3$$

$$256, 64, 27, 8$$

84. Which of the following is the greatest?

$$2^{60}, 3^{48}, 5^{36}, 7^{24}$$

निम्न में से सबसे बड़ा कौन है?

$$2^{\overline{60}}, 3^{\overline{48}}, 5^{\overline{36}}, 7^{\overline{24}}$$

(32)
 (81)
 (125)
 (49)

~~(A) 5^{36}~~

(C) 2^{60}

(B) 7^{24}

(D) 3^{48}

Handwritten calculations in orange:

5³⁶	4⁴⁸	3³⁶	2²⁴
2	3	5	7
32	81	125	49

85. Which of the following is the smallest?

$$5^{36}, 2^{24}, 3^{12}, 4^{48}$$

निम्न में कौन-सा सबसे छोटा है?

$$5^{\overline{36}}, 2^{\overline{24}}, 3^{\overline{12}}, 4^{\overline{48}}$$

(125) , (4) , (3) , (256)

~~(A) 3^{12}~~

(B) 2^{24}

(C) 4^{48}

(D) 5^{36}

86. If $x = 7 - 4\sqrt{3}$ find the value of $\left(x + \frac{1}{x}\right)$.

यदि $x = 7 - 4\sqrt{3}$ हो, तो $\left(x + \frac{1}{x}\right)$ का मान बताइए।

(A) $8\sqrt{3}$

(B) $14 + 8\sqrt{3}$

(C) 14

(D) $3\sqrt{3}$

$$\begin{array}{r}
 49 - 48 = 1 \\
 x = 7 - 4\sqrt{3} \\
 \frac{1}{x} = \frac{7 + 4\sqrt{3}}{7^2 - (4\sqrt{3})^2} \\
 \hline
 x + \frac{1}{x} = 14
 \end{array}$$

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

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

$$\begin{array}{r} x = 3 + 2\sqrt{2} \\ \frac{1}{x} = 3 - 2\sqrt{2} \\ \hline x + \frac{1}{x} = 6 \end{array}$$

$$\# x + \frac{1}{x} = a$$

$$\textcircled{i} x^2 + \frac{1}{x^2} = a^2 - 2$$

$$\textcircled{ii} x^3 + \frac{1}{x^3} = a^3 - 3a$$

$$\underline{\underline{\textcircled{1}}} x + \frac{1}{x} = 4$$

$$\textcircled{i} x^2 + \frac{1}{x^2} = 4^2 - 2 = 14$$

$$\textcircled{ii} x^3 + \frac{1}{x^3} = 4^3 - 3 \times 4 \\ = 64 - 12 = 52$$

$$\# x - \frac{1}{x} = a$$

$$\textcircled{i} x^2 + \frac{1}{x^2} = a^2 + 2$$

$$\textcircled{ii} x^3 - \frac{1}{x^3} = a^3 + 3a$$

$$\textcircled{2} x - \frac{1}{x} = 5$$

$$\textcircled{i} x^2 + \frac{1}{x^2} = 5^2 + 2 = 25 + 2 = 27$$

$$\textcircled{ii} x^3 - \frac{1}{x^3} = 5^3 + 3 \times 5 \\ = 125 + 15 \\ = 140$$

$$x = 5 + 2\sqrt{6}$$

$$x + \frac{1}{x} = 10$$

$$\begin{aligned}x^2 + \frac{1}{x^2} &= 10^2 - 2 \\ &= 100 - 2 \\ &= 98\end{aligned}$$

$$x = 5 + 2\sqrt{6}$$

$$\frac{1}{x} = 5 - 2\sqrt{6}$$

$$x + \frac{1}{x} = 10$$

87. If $a = 5 - 2\sqrt{6}$ find the value of $\left(\sqrt{a} - \frac{1}{\sqrt{a}}\right)^2$.

यदि $a = 5 - 2\sqrt{6}$ हो, तो $\left(\sqrt{a} - \frac{1}{\sqrt{a}}\right)^2$ का मान ज्ञात करें।

(A) 10

$$a = 5 - 2\sqrt{6}$$

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

~~(C)~~ 8

$$a + \frac{1}{a} = 10$$

(B) $10 + 20\sqrt{6}$ $\left(a + \frac{1}{a}\right)^{-2}$

(D) $10 + 2\sqrt{6}$

$$10^{-2} = 8$$

concept

$$x = \frac{p+q}{p-q}$$

$$y = \frac{p-q}{p+q}$$

$$\textcircled{i} \quad x+y = \frac{2(p^2+q^2)}{p^2-q^2}$$

$$\textcircled{ii} \quad x-y = \frac{4pq}{p^2-q^2}$$

$$\textcircled{iii} \quad x \times y = 1$$

88. If $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ and $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ find the value of $x^2 + y^2$

यदि $x = \frac{\overset{p+q}{\sqrt{3}+1}}{\underset{p-q}{\sqrt{3}-1}}$ और $y = \frac{\overset{p-q}{\sqrt{3}-1}}{\underset{p+q}{\sqrt{3}+1}}$ हो, तो $x^2 + y^2$ का मान ज्ञात करें।

(A) 13

(C) 15

(B) 14

(D) 10

$$\begin{aligned} \textcircled{1} x+y &= \frac{2(p^2+q^2)}{p^2-q^2} \\ &= \frac{2[3+1]}{3-1} = \frac{8}{2} = 4 \end{aligned}$$

$$\textcircled{ii} x \times y = 1$$

$$\begin{aligned} (x+y)^2 &= 2xy \\ 4^2 - 2 \times 1 &= 14 \\ 16 - 2 &= 14 \end{aligned}$$

$$\begin{aligned} \textcircled{1} \quad & a^2 + b^2 + (ab + ab) - ab \\ & a^2 + b^2 + 2ab - ab \\ & \underline{\hspace{2cm}} \\ & (a+b)^2 - ab \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad & a^2 + b^2 - ab - ab + ab \\ & a^2 + b^2 - 2ab + ab \\ & \underline{\hspace{2cm}} \\ & (a-b)^2 + ab \end{aligned}$$

89. If $a = \frac{\sqrt{5}+1}{\sqrt{5}-1}$ and $b = \frac{\sqrt{5}-1}{\sqrt{5}+1}$ find the value of.

$$\textcircled{i} \quad x+y = \frac{2(p^2+q^2)}{p^2-q^2}$$

$$\textcircled{ii} \quad x-y = \frac{4pq}{p^2-a^2}$$

$$\textcircled{iii} \quad xy = 1$$

यदि $a = \frac{\sqrt{5}+1}{\sqrt{5}-1}$ तथा $b = \frac{\sqrt{5}-1}{\sqrt{5}+1}$ हो, तो $\frac{(a^2+ab+b^2)}{(a^2-ab+b^2)}$ का मान $\frac{(a+b)^2-ab}{(a-b)^2+ab}$ ज्ञात करें।

$$\textcircled{i} \quad a+b = \frac{2[5+1]}{5-1} = \frac{12}{4} = 3$$

$$\textcircled{ii} \quad a \times b = 1$$

$$\textcircled{iii} \quad a-b = \frac{4 \times \sqrt{5} \times 1}{5-1} = \sqrt{5}$$

(A) $\frac{3}{4}$

(B) $\frac{4}{3}$

(C) $\frac{3}{5}$

(D) $\frac{5}{3}$

$$\frac{3^2-1}{\sqrt{5}^2+1} = \frac{9-1}{5+1} = \frac{8}{6} = \frac{4}{3}$$

90. If $6^x = 7^y = 42^z$ find the value of x in terms of y and z .

यदि $6^x = 7^y = 42^z$ हो, तो y और z के रूप में x का मान ज्ञात करें।

$$6^x = 7^y = 42^z = K \text{ (माना)}$$

$$\begin{array}{l|l|l} 6^x = K & 7^y = K & 42^z = K \\ 6 = K^{\frac{1}{x}} & 7 = K^{\frac{1}{y}} & 42 = K^{\frac{1}{z}} \end{array}$$

$$(A) \frac{y^2}{z} \quad \frac{1}{x} + \frac{1}{y} = \frac{1}{z}$$

$$(B) \frac{y}{z}$$

$$(C) \frac{y-z}{yz}$$

$$\frac{1}{x} = \frac{1}{z} - \frac{1}{y}$$

$$\frac{1}{x} = \frac{y-z}{zy}$$

$$(D) \frac{yz}{y-z}$$

$$a^m \times a^n = a^{m+n}$$

$$x = \frac{zy}{y-z}$$

$$6 \times 7 = 42$$

$$K^{\frac{1}{x}} \times K^{\frac{1}{y}} = K^{\frac{1}{z}}$$

$$K^{\left(\frac{1}{x} + \frac{1}{y}\right)} = K^{\frac{1}{z}}$$

$$\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$$

90. If $6^x = 7^y = 42^z$ find the value of x in terms of y and z .

यदि $6^x = 7^y = 42^z$ हो, तो y और z के रूप में x का मान ज्ञात करें।

$$6^x = 7^y = 42^z$$

II-method

$$6^1 \times 7^1 = 42^1$$

$$\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$$

$$\frac{1}{x} = \frac{1}{z} - \frac{1}{y} \Rightarrow x = \frac{yz}{y-z}$$

(A) $\frac{y^2}{z}$

(B) $\frac{y}{z}$

(C) $\frac{y-z}{yz}$

(D) $\frac{yz}{y-z}$

91. If $3^x = 7^y = 21^z$ find the value of z in terms of x and y .

$3^x = 7^y = 21^z$ हो, तो z का मान x और y रूप में ज्ञात करें।

(A) $\frac{x-y}{xy}$

(B) $\frac{xy}{x-y}$

(C) $\frac{x+y}{xy}$

~~(D) $\frac{xy}{x+y}$~~

$$3 \times 7 = 21$$

$$\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$$

$$\frac{x+y}{xy} = \frac{1}{z}$$

$$\frac{xy}{x+y} = z$$

2 pm to 4 pm