KHAN GLOBAL STUDIES | KGS

Most Trusted Learning Platform

KHAN SIR

Surds and Indices

घातांक तथा करणी

By: P.K Sir

Fix pattern

(1) $x = \sqrt{a+\sqrt{a+\sqrt{a+\sqrt{a+\cdots\infty}}}}$

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

(2) $y = \sqrt{a-\sqrt{a-\sqrt{a\cdots\infty}}}$

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

(i) $x+y = \sqrt{4a+1}$

(ii) $x-y = 1$

(iii) $x \times y = a$

① $x = \sqrt{12 + \sqrt{12 + \sqrt{12 + \cdots \infty}}}$

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

$$x = \frac{\sqrt{4 \times 12 + 1} + 1}{2} = \frac{\sqrt{49} + 1}{2}$$

$$= \frac{7+1}{2}$$

$= 4$ Ans.

$4 \times 12 + 1$

$48 + 1 = 49$

II-method

$$\sqrt{12 + \sqrt{12 + \sqrt{12 + \cdots \infty}}}$$

4 Ans.

(i) +Ve → सबसे बड़ा मान Ans. होगा

(ii) −Ve → सबसे छोटा मान Ans. होगा

② $\sqrt{56 - \sqrt{56 - \sqrt{56 - \cdots \infty}}}$ (① ① ①)

7×8

7 Ans.

③ $x = \sqrt{15 + 2\sqrt{15 + 2\sqrt{15 + 2\sqrt{15} \cdots \infty}}}$ (2 2 2)

3×5

3 Ans

④ $y = \sqrt{77 + 4\sqrt{77 + 4\sqrt{77 + 4\sqrt{77} \cdots \infty}}}$ (4 4 4)

7×11

11 Ans.

01. Find the value of $\sqrt{30+\sqrt{30+\sqrt{30+\ldots}}}$

$\sqrt{30+\sqrt{30+\sqrt{30+\ldots}}}$ कका मान ज्ञात कीजिए ?

$\sqrt{30} \Rightarrow 5 \times 6$

(a) 5

(b) $3\sqrt{10}$

(c) 6

(d) 7

02. Let $x=\sqrt{272+\sqrt{272+\sqrt{272+\sqrt{272+\ldots \text{to infinity}}}}}$;

then x equals

$272 = 16 \times 17$

(a) 16

(b) $4\sqrt{13}$

(c) 17

(d) 4.35

03.

Let $x = \sqrt{42 - \sqrt{42 - \sqrt{42 - \sqrt{42 - \ldots \text{ to infinity}}}}}$;

6 x 7

then x equals

(a) 6 (b) 7

(c) Between 6 and 7 (d) Greater than 7

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

$2+\sqrt{2+\sqrt{2+\sqrt{2+.....}}}$ का मान क्या है ?

(a) 1

(b) 2

(c) 3

(d) 4

$2+\sqrt{2+\sqrt{2+\sqrt{2+\cdots\infty}}}$ (2)

$2+2=4$ Ans.

$\sqrt{2+\sqrt{2+\sqrt{2+\sqrt{2+\cdots\infty}}}}$

2×1

05.

$$\sqrt{31+\sqrt{31+\sqrt{31+\sqrt{31}\ldots\infty}}} = ?$$

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

$$\frac{\sqrt{4\times31+1}+1}{2} = \frac{\sqrt{125}+1}{2}$$

(a) $5\sqrt{5}-1.5$

(b) $2.5\sqrt{5}+0.5$

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

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

$$= 2.5\sqrt{5}+0.5$$

(c) $\dfrac{5\sqrt{5}-1}{2}$

(d) $\dfrac{2\sqrt{31}+1}{2}$

$4\times31+1$

$124+1=125$

$\sqrt{125} = \sqrt{5\times25}$

$= 5\sqrt{5}$

06. $\sqrt{14+\sqrt{14+\sqrt{14+\sqrt{14+\ldots\infty}}}}$ lies between

(a) 4 and 4.5

(b) 4.5 and 5

(c) 3 and 4

(d) none

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

$$x=\frac{\sqrt{4\times14+1}+1}{2}=\frac{\sqrt{57}+1}{2}$$

$$\frac{\sqrt{49}+1}{2} \quad \frac{\sqrt{57}+1}{2} \quad \frac{\sqrt{64}+1}{2}$$

$$\frac{\sqrt{49}+1}{2}<x<\frac{\sqrt{64}+1}{2}$$

$$\frac{7+1}{2}<x<\frac{8+1}{2}$$

$$4<x<4.5$$

06. $x=\sqrt{14+\sqrt{14+\sqrt{14+\sqrt{14+\ldots\infty}}}}$ lies between

(a) 4 and 4.5

(b) 4.5 and 5

(c) 3 and 4

(d) none

$x=\frac{\sqrt{4\times14+1}+1}{2}=\frac{\sqrt{57}+1}{2}$

$\frac{\sqrt{49}+1}{2}$ $\quad\boxed{\frac{\sqrt{57}+1}{2}}\quad$ $\frac{\sqrt{64}+1}{2}$

$\frac{8}{2}<x<\frac{9}{2}$

$\boxed{4<x<4.5}$

$x = \sqrt{7+\sqrt{7+\sqrt{7}\ldots\infty}} \Rightarrow x = \frac{\sqrt{4\times7+1}+1}{2} = \frac{\sqrt{29}+1}{2}$

x का Range निकालें।

$\frac{\sqrt{25}+1}{2}$ $\quad$ $\boxed{\frac{\sqrt{29}+1}{2}}$ $\quad$ $\frac{\sqrt{36}+1}{2}$

$$\frac{5+1}{2} < x < \frac{6+1}{2}$$

$$\boxed{3 < x < 3.5}$$

07. If $a=\sqrt{13+\sqrt{13+\sqrt{13+\sqrt{13\ldots\infty}}}}$ and

$a=\sqrt{x+\sqrt{x+\sqrt{x}\ldots\infty}}$

$b=\sqrt{x-\sqrt{x-\sqrt{x}\ldots\infty}}$

$b=\sqrt{13-\sqrt{13-\sqrt{13-\sqrt{13\ldots\infty}}}}$, then which option is ture ?

(a) $a+b+1=0$

(b) $a-b-1=0$

(c) $a-b+1=0$

(d) $a-b+1=0$

(i) $a+b=\sqrt{4x+1}$

(ii) $a-b=1$

(iii) $a\times b=x$

$a-b=1$

$a-b-1=0$

08. Find $\sqrt{19-\sqrt{19-\sqrt{19-\sqrt{19\ldots\infty}}}} = ?$ $\frac{\sqrt{4a+1}-1}{2} = \frac{\sqrt{77}-1}{2}$

(a) $\frac{\sqrt{77}-1}{2}$

(b) $\frac{\sqrt{19}+3}{2}$

(c) $\frac{\sqrt{77}+1}{2}$

(d) Between 4 and 5

09.

Find $\sqrt{35+2\sqrt{35+2\sqrt{35+2\sqrt{35+\ldots\infty}}}} = ?$

5×7

(a) 6

(b) 7

(c) 5

(d) 6.4

10. Find $\sqrt{154+3\sqrt{154+3\sqrt{154+3\sqrt{154+\ldots\infty}}}}=?$

11×14

(a) 13

(b) 14

(c) 11

(d) $\dfrac{\sqrt{613}+9}{2}$

11. Find $\sqrt{3+4\sqrt{3+4\sqrt{3+4\sqrt{3+\ldots\infty}}}} = ?$

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

(b) $2\sqrt{7}-3$

(c) $2\sqrt{7}$

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

H.W

Yt → KUNS SSC Exams

(I) MDH concept
(II) RL concept
(III) work and wages concept

9AM to 12PM → Sad.

9AM to 12PM → Sunday
Pipe and cister complete