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SURDS & INDICES

(घातांक एवं करणी)

1. $x = \sqrt{56 + \sqrt{56 + \sqrt{56 + \dots \infty}}}$ Solve it.

2. $x = \sqrt{12 + \sqrt{12 + \sqrt{12 + \dots \infty}}}$ Solve it.

3. $x = \sqrt{42 - \sqrt{42 - \sqrt{42 - \sqrt{42 \dots \infty}}}}$ Solve it.

4. $x = \sqrt{35 + 2\sqrt{35 + 2\sqrt{35 + 2 \dots \infty}}}$ Solve it.

5. $x = \sqrt{80 + 2\sqrt{80 + 2\sqrt{80 + 2 \dots \infty}}}$ Solve it.

6. $x = \sqrt{108 - 3\sqrt{108 - 3\sqrt{108 - 3 \dots \infty}}}$ Solve it.

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

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

$$x = \sqrt{a + b\sqrt{a + b\sqrt{a + b\sqrt{a + b\sqrt{a \dots \infty}}}}} = \frac{\sqrt{4a+b^2}+b}{2}$$

$$y = \sqrt{a - b\sqrt{a - b\sqrt{a - b\sqrt{a \dots \infty}}}}} = \frac{\sqrt{4a+b^2}-b}{2}$$

$$x = \sqrt{a + \sqrt{a - \sqrt{a + \sqrt{a - \sqrt{a \dots \infty}}}}} = \frac{\sqrt{4a-3}+1}{2}$$

$$y = \sqrt{a - \sqrt{a + \sqrt{a - \sqrt{a + \sqrt{a \dots \infty}}}}} = \frac{\sqrt{4a-3}-1}{2}$$

$$x = \sqrt{a + b\sqrt{a - b\sqrt{a + b\sqrt{a - b\sqrt{a \dots \infty}}}}} = \frac{\sqrt{4a-3b^2}+b}{2}$$

$$y = \sqrt{a - b\sqrt{a + b\sqrt{a - b\sqrt{a \dots \infty}}}}} = \frac{\sqrt{4a-3b^2}-b}{2}$$

7. $x = \sqrt{31 + \sqrt{31 + \sqrt{31 + \dots \infty}}}$ Solve it.

8. $x = \sqrt{7 - \sqrt{7 - \sqrt{7 - \dots \infty}}}$ Solve it.

9. If $x = \sqrt{13 + \sqrt{13 + \sqrt{13 + \dots \infty}}}$
 $y = \sqrt{13 - \sqrt{13 - \sqrt{13 + \dots \infty}}}$

Find $x - y$.

- (A) 0 (B) 1
(C) -1 (D) 2

10. $\sqrt{3 + 4\sqrt{3 + 4\sqrt{3 + 4\sqrt{3 + \dots \infty}}}}$ Solve it.

11. $\sqrt{7 - 3\sqrt{7 - 3\sqrt{7 - 3\sqrt{7 \dots \infty}}}}$ Solve it.

12. $\sqrt{13 + \sqrt{13 - \sqrt{13 + \sqrt{13 - \sqrt{13 \dots \infty}}}}}$ Solve it.

13. $\sqrt{4 - \sqrt{4 + \sqrt{4 - \sqrt{4 \dots \infty}}}}$ Solve it.

14. $\sqrt{7\sqrt{7\sqrt{7\sqrt{7}}}}$ Solve it.

15. $\sqrt{5\sqrt{5\sqrt{5\sqrt{5 \dots \infty}}}}$ Solve it.

16. $\sqrt{7\sqrt{7\sqrt{7 \dots \infty}}}$ up to 8 term

17. $\sqrt[3]{7\sqrt[3]{7\sqrt[3]{7\sqrt[3]{7}}}}$ Solve it.

18. $\sqrt{27 \div \sqrt{27 + \sqrt{27 \div \dots \infty}}}$ Solve it.

19. $x + \sqrt{x^2 + \sqrt{x^4 + \sqrt{x^{16} \dots \infty}}}$ Solve it.

(A) $x\left(\frac{\sqrt{5}+2}{2}\right)$ (B) $x\left(\frac{3+\sqrt{5}}{2}\right)$

(C) $\frac{x}{1+\sqrt{x}}$ (D) $x\left(\frac{\sqrt{5}+1}{2}\right)$

20. $x = \sqrt{2^3 4} \sqrt{2^3 4} \sqrt{2^3 4} \dots \infty$ Solve it.

21. $x = \sqrt{7^3 49} \sqrt{7^3 49} \sqrt{7^3 49} \dots \infty$ Solve it.

22. $x = \sqrt{a^3 b} \sqrt{a^3 b} \sqrt{a^3 b} \dots \infty$ Solve it.

$(\sqrt{a} + \sqrt{b})$ & $(\sqrt{c} + \sqrt{d})$ Condition $a + b = c + d$

$ab > cd$, Then $(\sqrt{a} + \sqrt{b}) > (\sqrt{c} + \sqrt{d})$

$ab < cd$, Then $(\sqrt{a} + \sqrt{b}) < (\sqrt{c} + \sqrt{d})$

23. Which is correct.

(a) $(\sqrt{11} + \sqrt{7}) < (\sqrt{10} + \sqrt{8})$

(b) $(\sqrt{17} + \sqrt{11}) > (\sqrt{15} + \sqrt{13})$

24. Find the smallest number.

सबसे छोटी संख्या बताओ।

(A) $\sqrt{8} + \sqrt{5}$ (B) $\sqrt{7} + \sqrt{6}$

(C) $\sqrt{10} + \sqrt{3}$ (D) $\sqrt{11} + \sqrt{2}$

25. Which is correct.

(a) $(\sqrt{5} + \sqrt{5}) > (\sqrt{7} + \sqrt{3})$

(b) $(\sqrt{6} + \sqrt{7}) > (\sqrt{8} + \sqrt{5})$

(c) $(\sqrt{3} + \sqrt{9}) > (\sqrt{6} + \sqrt{6})$

26. Find the smallest & greatest number.

सबसे छोटी व बड़ी संख्या ज्ञात करो?

(A) $= \sqrt{18} + \sqrt{10}$ (B) $= \sqrt{36} + \sqrt{5}$

(C) $= \sqrt{20} + \sqrt{9}$ (D) $= \sqrt{45} + \sqrt{4}$

27. Which is greatest number.

सबसे बड़ी संख्या बताओ।

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

28. Which one of the following is the biggest.

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

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

(B) $\sqrt[4]{6}$

(C) $\sqrt[6]{15}$

(D) $\sqrt[12]{245}$

29. Which one of the following is Largest.

$\sqrt[3]{6}, \sqrt[2]{5}$ and $\sqrt[6]{12}$

(A) $\sqrt[3]{6}$

(B) $\sqrt[2]{5}$

(C) $\sqrt[6]{12}$

(D) All are equal

30. Find smallest number.

$\sqrt[3]{3}, \sqrt[3]{4}, \sqrt[4]{10}, \sqrt[12]{150}$

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

(B) $\sqrt[12]{150}$

(C) $\sqrt[4]{10}$

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

31. Which following is true?

(A) $\sqrt[3]{11} > \sqrt{7} > \sqrt[4]{45}$

(B) $\sqrt{7} > \sqrt[3]{11} > \sqrt[4]{45}$

(C) $\sqrt{7} > \sqrt[4]{45} > \sqrt[3]{11}$

(D) $\sqrt[4]{45} > \sqrt{7} > \sqrt[3]{11}$

32. $\frac{2}{\sqrt{7} + \sqrt{5}} + \frac{7}{\sqrt{12} - \sqrt{5}} - \frac{5}{\sqrt{12} - \sqrt{7}}$ Solve it.

(A) 5

(B) 2

(C) 1

(D) 0

33. $\frac{1}{\sqrt{3} + \sqrt{4}} + \frac{1}{\sqrt{4} + \sqrt{5}} + \frac{1}{\sqrt{5} + \sqrt{6}} + \frac{1}{\sqrt{6} + \sqrt{7}}$
 $+ \frac{1}{\sqrt{7} + \sqrt{8}} + \frac{1}{\sqrt{8} + \sqrt{9}}$ Solve it.

(A) $\sqrt{3}$

(B) $3\sqrt{3}$

(C) $3 - \sqrt{3}$

(D) $5 - \sqrt{3}$

34. $\frac{3\sqrt{2}}{\sqrt{6} + \sqrt{3}} - \frac{2\sqrt{6}}{\sqrt{3} + 1} + \frac{2\sqrt{3}}{\sqrt{6} + 2}$ is equal to.

(A) 3

(B) 2

(C) 0

(D) $\sqrt{3}$

35. If $x = \frac{\sqrt{5+2\sqrt{6}}}{\sqrt{5-2\sqrt{6}}}$, find value of $x^2 - 10x$.

(A) 1

(B) -1

(C) 2

(D) 0

36. $\frac{1}{\sqrt{2} + \sqrt{3} - \sqrt{5}} + \frac{1}{\sqrt{2} - \sqrt{3} - \sqrt{5}}$ Solve it.

- (A) $\frac{1}{2}$ (B) $\frac{1}{\sqrt{2}}$
(C) $\frac{1}{\sqrt{3}}$ (D) None

37. $\frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} + \frac{\sqrt{7} - \sqrt{5}}{\sqrt{7} + \sqrt{5}}$ Solve it.

- (A) 12 (B) 10
(C) 0 (D) 11

38. $\frac{\sqrt{3} + 1}{\sqrt{3} - 1} + \frac{\sqrt{2} + 1}{\sqrt{2} - 1} + \frac{\sqrt{3} - 1}{\sqrt{3} + 1} + \frac{\sqrt{2} - 1}{\sqrt{2} + 1}$ Solve it.

- (A) 10 (B) 12
(C) 7 (D) 0

39. Solve $\frac{15}{\sqrt{10} + \sqrt{20} + \sqrt{40} - \sqrt{5} - \sqrt{80}}$,

Given $\sqrt{10} = 3.162$

$\sqrt{5} = 2.236$

- (A) 5 (B) 4.362
(C) 5.398 (D) 6.343

40. $\frac{\sqrt{(\sqrt{12} - \sqrt{8})(\sqrt{3} + \sqrt{2})}}{5 + \sqrt{24}}$ Solve it.

- (A) $\sqrt{6} - \sqrt{2}$ (B) $\sqrt{6} + \sqrt{2}$
(C) $\sqrt{6} - 2$ (D) $2 - \sqrt{6}$

41. $\frac{(\sqrt{3} + \sqrt{5})(\sqrt{5} + \sqrt{2})}{\sqrt{2} + \sqrt{3} + \sqrt{5}}$ Solve it.

- (A) $\sqrt{2} + \sqrt{3} + \sqrt{5}$
(B) $\frac{3}{2}(\sqrt{2} + \sqrt{3} + \sqrt{5})$
(C) $\frac{1}{4}(\sqrt{2} + \sqrt{3} + \sqrt{5})$
(D) $\frac{1}{2}(\sqrt{2} + \sqrt{3} + \sqrt{5})$

42. $\sqrt{15} + \sqrt{60} + \sqrt{84} + \sqrt{140} = \sqrt{a} + \sqrt{b} + \sqrt{c}$, find $a + b + c$

- (A) 15 (B) 10
(C) 12 (D) 8

43. $\frac{3 \times 9^{n+1} + 9 \times 3^{2n-1}}{9 \times 3^{2n} - 6 \times 9^{n-1}}$ is equal to

- (A) $3\frac{3}{5}$ (B) $3\frac{2}{5}$
(C) $3\frac{1}{5}$ (D) 3

44. If $2^{2^x} = 16^{2^{3x}}$, find value of x

- (A) -1 (B) 2
(C) 3 (D) None

45. $\sqrt[3]{a} = \sqrt[3]{26} + \sqrt[3]{7} + \sqrt[3]{63}$ Solve it.

- (A) $a < 729$ but $a > 216$
(B) $a < 216$
(C) $a > 729$
(D) $a = 729$

46. If $x^{x^{\sqrt{x}}} = x\sqrt{x}^x$, find x .

- (A) $3/4$ (B) $9/4$
(C) $7/4$ (D) None

47. If $5^{10x} = 4900$ and $2^{\sqrt{y}} = 25$

find $\frac{[5^{(x-1)}]^{-5}}{4^{-\sqrt{y}}}$

- (A) $14/5$ (B) 5
(C) 14 (D) 13

48. $\sqrt[3]{2 + \sqrt{5}} + \sqrt[3]{2 - \sqrt{5}} + \sqrt{3 - 2\sqrt{2}} = ?$

- (A) $\sqrt{3}$ (B) $\sqrt{2}$
(C) 2 (D) None

49. $(\sqrt{6} + \sqrt{10} - \sqrt{21} - \sqrt{35})(\sqrt{6} - \sqrt{10} + \sqrt{21} - \sqrt{35})$

Solve it.

- (A) 10 (B) 5
(C) 7 (D) 9

50. If $25^{x-1} = 5^{2x-1} - 100$ find out x .

- (A) 1 (B) 2
(C) -2 (D) -3

51. $(3^{33} + 3^{33} + 3^{33})(2^{33} + 2^{33}) = 6^x$, find value of x .

- (A) 34 (B) 35
(C) 33 (D) 33.5

52. If $2^{x-1} + 2^{x+1} = 1280$. Find value of x .

- (A) 7 (B) 8
(C) 9 (D) 12

53. If $5a^3b = 1280$ and $4ab^3 = 2500$. Find ab .
- (A) 15 (B) 20
(C) 25 (D) 30
54. $\sqrt{4600 + \sqrt{540 + \sqrt{1280 + \sqrt{250 + \sqrt{36}}}}}$
Solve it.
- (A) 69 (B) 68
(C) 70 (D) 72
55. $\sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{7 + 4\sqrt{3}}}}$ Solve it.
- (A) 3 (B) 2
(C) $\sqrt{3}$ (D) None
56. If $\sqrt{x}^{\sqrt{x}^{\sqrt{x}^{\sqrt{x}^{\dots}}}}} = 9$. Find value of x .
57. If $2^{4x-1} = 4^x$, find 16^x .
- (A) 3 (B) 2
(C) 4 (D) 5
58. Which is value among 3^{200} , 2^{300} and 7^{100} is the largest?
- (A) 3^{200} (B) 2^{300}
(C) 7^{100} (D) All are equal
59. Which of the following is correct.
- I. $3^{33} > 33^3$ II. $33^3 > 333$
III. $3^{33} > 333$
- (A) Only I and II (B) Only II and III
(C) Only II (D) All I, II and III
60. If $5^{3a} + 2^{2b+2} = 189$, $5^{a+2} + 2^{b-1} = 127$. Find $4a + 3b$.
- (A) 10 (B) 5
(C) 9 (D) 8