

46. If $6^x - 6^{x-1} = 180$, then the value of $\frac{2x-1}{2x+3}$ is:

यदि $6^x - 6^{x-1} = 180$ है, तो $\frac{2x-1}{2x+3}$ का मान ज्ञात कीजिए।

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[A] $\frac{5}{14}$

[C] $\frac{5}{6}$

[B] $\frac{5}{9}$

[D] $\frac{5}{12}$

$\frac{5}{9}$

$6^x > 180$

$x=3$

#

46. If $6^x - 6^{x-1} = 180$, then the value of $\frac{2x-1}{2x+3}$ is:

यदि $6^x - 6^{x-1} = 180$ है, तो $\frac{2x-1}{2x+3}$ का मान ज्ञात कीजिए।

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[A] $\frac{5}{14}$

[C] $\frac{5}{6}$

[B] $\frac{5}{9}$

[D] $\frac{5}{12}$

$\frac{5}{9}$

$$6^x - \frac{6^x}{6} = 180$$

$$6^x \left(1 - \frac{1}{6}\right) = 180$$

$$6^x \times \frac{5}{6} = 180$$

$$6^x = 6^3$$

$$\Rightarrow x = 3$$

#

47. If $5^{x+1} - 5^{x-1} = 600$, then what is the value of 10^{2x} ?

यदि $5^{x+1} - 5^{x-1} = 600$ है, तो 10^{2x} का मान क्या है?

[A] 1

[C] 100000

[B] 1000

[D] 1000000

put $x=3$

48. If $9^k + 3^{(2k-1)} = \frac{2}{3} \left[5^{\left(k+\frac{1}{2}\right)} + 5^{\left(k-\frac{1}{2}\right)} \right]$, then k is equal to:

यदि $9^{\textcircled{k}} + 3^{(2k-1)} = \frac{2}{3} \left[5^{\left(k+\frac{1}{2}\right)} + 5^{\left(k-\frac{1}{2}\right)} \right]$, है, तो k किसके बराबर है?

[RRB Group-D 2025]

✓ [A] $\frac{1}{2} = k$

[B] $\frac{5}{2}$

[C] $\frac{3}{2}$

[D] 1

$$3+1 = \frac{2}{3} \times [5+1]$$

$$4 = 4$$



49. Let $0 < x < 1$. Then the correct inequality is

यदि $0 < x < 1$ तो सही सम्बन्ध कौन सा है

[A] $x < \sqrt{x} < x^2$

[B] $\sqrt{x} < x < x^2$

[C] $x^2 < x < \sqrt{x}$

[D] $\sqrt{x} < x^2 < x$

$\cdot 64 < \sqrt{64}$

$\cdot 64 < \cdot 80$

यदि, $x > 1$

$$\sqrt{x} < x < x^2$$

$$2 < 4 < 16$$

if, $0 < x < 1$

$$x^2 < x < \sqrt{x}$$

$$\frac{1}{16} < \frac{1}{4} < \frac{1}{2}$$

माना

Infinite Series →

यदि, $a > 0$

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

Let (माना) $x = \sqrt{a \cdot \sqrt{a \cdot \sqrt{a \dots \dots \infty}}}$

$$x = \sqrt{a \cdot x}$$

$$x = a \cdot x$$

$$x = a$$



50. $\sqrt{12\sqrt{12\sqrt{12\sqrt{12}\dots\infty}}}=?$

[A] 8

[C] 36

[B] 12

[D] 6

$7 = 343^{y-1}$
 $343^{\frac{1}{3}} = 343^{y-1}$



52. Find $\sqrt{12\sqrt{12\sqrt{12\sqrt{12\sqrt{12\sqrt{12}}}}}} = ?$

Trick $\Rightarrow$

[A] $12^{\frac{32}{31}}$

[B] $12^{\frac{64}{63}}$

[C] $12^{\frac{31}{32}}$

[D] $12^{\frac{63}{64}}$

$= 12^{\frac{63}{64}}$

$$a > 0$$

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

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

$$xy = \frac{(\frac{\sqrt{4a+1}}{2})^2 - 1^2}{4} = \frac{4a+1}{4} - \frac{1}{4} = a$$

याद
रखो

$$(x - y) = 1$$

$$xy = a$$

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

$$56 = 8 \times 7$$

$$\text{माना } x = \sqrt{56 + \sqrt{56 + \sqrt{56 + \dots \dots \dots \infty}}} = 8$$

$$y = \sqrt{56 - \sqrt{56 - \sqrt{56 - \dots \dots \dots \infty}}} = 7$$

$$(x - y) = 1$$

$$8 - 7$$

$$x \times y = 56$$

$$8 \times 7$$

$$a > 0$$

माना, $x = \sqrt{a + \sqrt{a + \sqrt{a + \dots \infty}}}$

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

$$x^2 = a + x$$

$$1 \cdot x^2 - 1x - a = 0$$

$$x = \frac{1 \pm \sqrt{1 - 4 \times 1 \times -a}}{2 \times 1} = \frac{1 + \sqrt{1 + 4a}}{2} \text{ या } \frac{\sqrt{4a+1} + 1}{2}$$

$$\text{If, } ax^2 + bx + c = 0$$

$$\Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



$$\sqrt{20 + \sqrt{20 + \sqrt{20 + \dots \dots \infty}}} = 5 \checkmark$$

$$Q = 5 \times 4$$

$$\sqrt{29 + \sqrt{29 + \sqrt{29 + \dots \dots \infty}}} = \frac{\sqrt{117} + 1}{2}$$

$$Q = 29$$

$$\sqrt{Q + \sqrt{Q + \dots \dots}} = \frac{\sqrt{4Q+1} + 1}{2}$$

53. If $x = \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}}$ and $y = \sqrt{30 - \sqrt{30 - \sqrt{30 - \sqrt{30 - \dots \infty}}}}$, then what will the remainder be when the product of x and y is divided by 7?

यदि $x = \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}}$ और $y = \sqrt{30 - \sqrt{30 - \sqrt{30 - \sqrt{30 - \dots \infty}}}}$ है, तो x और y के गुणनफल को 7 से भाग देने पर शेषफल कितना प्राप्त होगा?

[RRB Group- D 2025]

[A] 1

[C] 4

[B] 2

[D] 3

$$\frac{30}{7} = \text{Rem } 2$$

$$30 = 6 \times 5$$

$$x \cdot y = 30$$

54. Let $x = \sqrt{272 + \sqrt{272 + \sqrt{272 + \sqrt{272 + \dots \text{to infinity}}}}}$; then x equals

मान लीजिए $x = \sqrt{272 + \sqrt{272 + \sqrt{272 + \sqrt{272 + \dots \text{to infinity}}}}}$; तो x किसके बराबर है?

[A] 16

[C] 17

[B] $4\sqrt{13}$

[D] 4.35

$$272 = 16 \times 17$$

55. $\sqrt{0.56 + \sqrt{0.56 + \dots \dots \dots \infty}} = ?$

☒ [A] 1.4

[B] 1.2

[C] 1.3

[D] 1.1

$$.56 = \textcircled{1.4} \times .4$$

56. Let $x = \sqrt{42 - \sqrt{42 - \sqrt{42 - \sqrt{42 - \dots \text{to infinity}}}}}$; then x equals

मान लीजिए $x = \sqrt{42 - \sqrt{42 - \sqrt{42 - \sqrt{42 - \dots \text{to infinity}}}}}$; तो x किसके बराबर है?

☒ [A] 6

[B] 7

[C] Between 6 and 7

[D] Greater than 7

$$42 = 6 \times 7$$

57.
$$\frac{\sqrt{210 + \sqrt{210 + \sqrt{210 + \dots}}}}{\sqrt{156 - \sqrt{156 - \sqrt{156 - \dots}}}} = ?$$

$$\frac{\sqrt{5}}{12} = \frac{5}{4}$$

[A] 1

[B] 1.33

☒ [C] 1.25

[D] 1.5

$$210 = 15 \times 14$$

$$156 = 13 \times 12$$

58. $\sqrt{31 + \sqrt{31 + \sqrt{31 + \sqrt{31 + \dots \infty}}}} = ?$

[A] $5\sqrt{5} - 1.5$

[C] $\frac{5\sqrt{5}-1}{2}$

[B] $2.5\sqrt{5} + 0.5$

[D] $\frac{2\sqrt{31}+1}{2}$

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

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

59. If $a = \sqrt{13 + \sqrt{13 + \sqrt{13 + \sqrt{13} \dots \infty}}}$ and $b = \sqrt{13 - \sqrt{13 - \sqrt{13 - \sqrt{13} \dots \infty}}}$, then which option is true?

यदि $a = \sqrt{13 + \sqrt{13 + \sqrt{13 + \sqrt{13} \dots \infty}}}$ और $b = \sqrt{13 - \sqrt{13 - \sqrt{13 - \sqrt{13} \dots \infty}}}$, तो कौन सा विकल्प सत्य है?

[A] $a + b + 1 = 0$

[C] $a - b + 1 = 0$

☒ [B] $a - b - 1 = 0$

[D] $a - b + 1 = 0$

$$a - b = 1$$

$$a \times b = 13$$

$$a - b - 1 = 0$$



60. Which among $2^{1/2}$, $3^{1/3}$, $4^{1/4}$, $6^{1/6}$ and $12^{1/12}$ is the largest?

$2^{1/2}$, $3^{1/3}$, $4^{1/4}$, $6^{1/6}$ और $12^{1/12}$ में से कौन सा सबसे बड़ा है?

[A] $2^{1/2}$

~~[B] $3^{1/3}$~~

[C] $4^{1/4}$

[D] $6^{1/6}$

[E] $12^{1/12}$

Smallest

$$\left(\frac{1}{2} \right)^{12}$$

$$2^6$$

$$64$$

$$\left(\frac{1}{3} \right)^{12}$$

$$3^4$$

$$81$$

$$\left(\frac{1}{4} \right)^{12}$$

$$4^3$$

$$64$$

$$\left(\frac{1}{6} \right)^{12}$$

$$6^2$$

$$36$$

$$\left(\frac{1}{12} \right)^{12}$$

$$12$$

$$12$$

$$11^{\frac{1}{3}}$$

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

$$45^{\frac{1}{4}}$$

$$11^4$$

$$7^6$$

$$45^3$$

$$121^2$$

$$343^2$$

$$315^2 \text{ से होगा}$$

$$(11^2)^2$$

$$(7^3)^2$$

$$(12)^2$$

67. Which of the following is TRUE?

निम्नलिखित में से कौन सा सत्य है?

I. ~~$\sqrt[3]{11} > \sqrt{7} > \sqrt[4]{45}$~~

II. ~~$\sqrt{7} > \sqrt[3]{11} > \sqrt[4]{45}$~~

III. $\sqrt{7} > \sqrt[4]{45} > \sqrt[3]{11}$

IV. ~~$\sqrt[4]{45} > \sqrt{7} > \sqrt[3]{11}$~~

[A] Only I/केवल I

[B] Only II/केवल II

[C] Only III/केवल III

[D] Only IV/केवल IV

$$\begin{aligned} 45^3 &= 45^2 \times 45 \\ &\approx 45^2 \times 7^2 \downarrow \\ &\approx 315^2 \downarrow \end{aligned}$$

61. The greatest number among 2^{72} , 5^{36} , 11^{24} and 3^{60} is
 2^{72} , 5^{36} , 11^{24} और 3^{60} में सबसे बड़ी संख्या है?

[RRB Group- D 2022]

$\div 12$

[A] 2^{72} *smallest*

[B] 5^{36}

[C] 11^{24}

☒ [D] 3^{60}

2^6 5^3 11^2 3^5
 64 125 121 243

Sum Same

→ If the sum is the same, the number with the larger product is the larger number, and the number with the smaller product is the smaller number. / अगर sum same है, तो जिसका गुणा बड़ा, वह संख्या बड़ी, जिसका गुणा छोटा वह संख्या छोटी होगी

$$(\sqrt{17} + \sqrt{6}) < (\sqrt{10} + \sqrt{13})$$

$$17 \times 6 < 10 \times 13$$

$$(\sqrt{17} + \sqrt{6})^2 < (\sqrt{10} + \sqrt{13})^2$$

$$17 + 6 + 2\sqrt{102} < 10 + 13 + 2\sqrt{130}$$

62. The smallest of $(\sqrt{8} + \sqrt{5})$, $(\sqrt{7} + \sqrt{6})$, $(\sqrt{10} + \sqrt{3})$, and $(\sqrt{11} + \sqrt{2})$ is:
- $(\sqrt{8} + \sqrt{5})$, $(\sqrt{7} + \sqrt{6})$, $(\sqrt{10} + \sqrt{3})$, और $(\sqrt{11} + \sqrt{2})$ में से सबसे छोटा मान है:
- [A] $(\sqrt{8} + \sqrt{5})$ ~~[B] $(\sqrt{7} + \sqrt{6})$~~ *largest*
- [C] $(\sqrt{10} + \sqrt{3})$ [D] $(\sqrt{11} + \sqrt{2})$

$$8000 = 13(\text{fixed})$$

$$40 \quad (42) \quad 30 \quad 22$$

sum

$$a + b = 10 \text{ (fixed)}$$

$$\begin{array}{l} 1 + 9 \\ 2 + 8 \\ 3 + 7 \\ 4 + 6 \\ 5 + 5 \end{array}$$

$$(a \times b) = ?$$

बढ़ रही है

$$\begin{array}{l} 9 \\ 16 \\ 21 \\ 24 \\ \textcircled{25} \rightarrow \text{max} \end{array}$$

दोनों संख्या के बीच का अंतर जितना कम होगा
उनके Product की Value उतनी बड़ी होगी

63. The smallest of, $(\sqrt{69} + 2\sqrt{7})$, $(\sqrt{61} + 6)$, $(5\sqrt{3} + \sqrt{22})$, and $(\sqrt{58} + \sqrt{39})$ is:
 $(\sqrt{69} + 2\sqrt{7})$, $(\sqrt{61} + 6)$, $(5\sqrt{3} + \sqrt{22})$, और $(\sqrt{58} + \sqrt{39})$ में से सबसे छोटा है:

[A] $(\sqrt{61} + 6)$

[B] $(\sqrt{69} + 2\sqrt{7})$

~~[C] $(5\sqrt{3} + \sqrt{22})$~~
smallest

[D] $(\sqrt{58} + \sqrt{39})$ *largest*

$\sqrt{69} + \sqrt{28}$, $\sqrt{61} + \sqrt{36}$, $\sqrt{75} + \sqrt{22}$, $\sqrt{58} + \sqrt{39}$
सबसे कम

$Sum = 97$ (fixed)

Max Product

64. Which is the greatest among $(\sqrt{19} + \sqrt{31})$, $(\sqrt{23} + 3\sqrt{3})$, $(\sqrt{17} + \sqrt{33})$, 10?

$(\sqrt{19} + \sqrt{31})$, $(\sqrt{23} + 3\sqrt{3})$, $(\sqrt{17} + \sqrt{33})$, 10 निम्नलिखित में से कौन सी संख्या सबसे बड़ी है?

[A] $(\sqrt{17} + \sqrt{33})$

[B] $(\sqrt{23} + 3\sqrt{3})$

[C] 10 ✓

[D] $(\sqrt{19} + \sqrt{31})$

$$\sqrt{19} + \sqrt{31}$$

$$\sqrt{23} + \sqrt{27}$$

$$\sqrt{17} + \sqrt{33}$$

$$10 = \boxed{\sqrt{25} + \sqrt{25}}$$

$$80m = 50 \text{ (fixed)}$$

बड़ा

छोटा

$$\sqrt{15} - \sqrt{11} > \sqrt{43} - \sqrt{39}$$

diff same
④

$$\frac{4}{(\sqrt{15} + \sqrt{11})}$$

$$\frac{4}{(\sqrt{43} + \sqrt{39})}$$

$$\frac{\sqrt{15} - \sqrt{11} \times \sqrt{15} + \sqrt{11}}{\sqrt{15} + \sqrt{11}}$$



65. Which is the greatest among $(\sqrt{17} - \sqrt{14})$, $(\sqrt{19} - 4)$, $(\sqrt{22} - \sqrt{19})$, $(\sqrt{13} - \sqrt{10})$?

$(\sqrt{17} - \sqrt{14})$, $(\sqrt{19} - 4)$, $(\sqrt{22} - \sqrt{19})$, $(\sqrt{13} - \sqrt{10})$ में से सबसे बड़ा कौन सा है?

[A] $(\sqrt{17} - \sqrt{14})$

[B] $(\sqrt{19} - \sqrt{6})$

[C] $(\sqrt{22} - \sqrt{19})$

[D] $(\sqrt{13} - \sqrt{10})$

smallest

largest

$= 3$
diff same

66. Which one among the following is the smallest?

निम्नलिखित में से कौन सी संख्या सबसे छोटी है?

[A] $\sqrt{201} - \sqrt{199}$

[B] $\sqrt{101} - \sqrt{99}$

[C] $\sqrt{301} - \sqrt{299}$

[D] $\sqrt{401} - \sqrt{399}$

diff same

- $\sqrt{2} \approx 1.414$

- $\sqrt{3} \approx 1.732$

- $\sqrt{5} \approx 2.24$

- $\sqrt{6} \approx 2.45$

- $\sqrt{10} \approx 3.16$



- **लगभग वर्गमूल** $= \sqrt{a} \pm \frac{b}{2\sqrt{a}}$

- $\sqrt{177} \approx \textcircled{13} + \frac{8}{26} \approx \underline{13.308}$

$$\sqrt{169}$$

$$\sqrt{19} = \textcircled{4} + \frac{3}{8} = 4.375$$

$$\sqrt{16} = 4$$


$$\sqrt{59} = 8 - \frac{5}{2 \times 8}$$
$$= 8 - 0.31$$

$$\sqrt{64}$$

$$\approx 7.69$$

$$\sqrt{81}$$


$$\sqrt{85} = 9 + \frac{\cancel{4}}{\cancel{18}}$$
$$\approx 9.222$$



Chapter end

