

6. The value of $(0.04)^{-1.5}$ is?

$(0.04)^{-1.5}$ का मान है?

(RRB ALP 2024)

[A] 25

[B] 250

[C] 625

✓ [D] 125

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

$$.04^{-1.5} = \frac{1}{.04^{\frac{3}{2}}}$$

$$= \frac{1}{(.04^{\frac{1}{2}})^3} = \frac{1^3}{.2^3} = \left(\frac{1}{.2}\right)^3 = 5^3$$

$$\sqrt{.04}$$

7. Find the value of $(\sqrt{5} + \sqrt{3})(\sqrt{5} - \sqrt{3})$

$(\sqrt{5} + \sqrt{3})(\sqrt{5} - \sqrt{3})$ का मान ज्ञात करें।

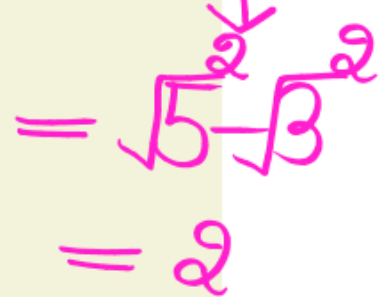
(SSC CHSL Mains 2025)

[A] 2

[B] 8

[C] 4

[D] 6


$$\begin{aligned} &= \sqrt{5}^2 - \sqrt{3}^2 \\ &= 5 - 3 \\ &= 2 \end{aligned}$$

8. If $8^{3x-5} = \frac{1}{32^{7-4x}}$ then $x=?$

यदि $8^{3x-5} = \frac{1}{32^{7-4x}}$ है, तो $x=?$

[A] $\frac{16}{9}$
[C] $\frac{25}{13}$

[B] $\frac{20}{11}$
[D] 2

$$(2^3)^{3x-5} = (2^5)^{4x-7}$$

$$9x-15 = 20x-35$$

$$2 = 2$$

$2^0 = 1$

$\frac{1}{2^n} = 2^{-n}$

$\frac{1}{2^n} = 2^{-n}$

$(2^n)^m = 2^{nm}$

9. If $x^{x\sqrt{x}} = (x\sqrt{x})^x$, then x equal to?

अगर $x^{x\sqrt{x}} = (x\sqrt{x})^x$ है, तो x किसके बराबर है?

[A] 4/9

[B] 16/9

[C] 3/2

[D] 9/4

$x\sqrt{x} =$

$x^1 \cdot x^{\frac{1}{2}}$

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

$x\sqrt{x} \rightarrow \frac{3x}{2}$

$x = x$

$\Rightarrow \cancel{x\sqrt{x}} = \frac{3}{2}\cancel{x}$

$\Rightarrow x = \frac{9}{4}$

10. If $4 \times 4^{(n+5)} = 256$, then the value of $5^{(n+4)}$ is:

यदि $4 \times 4^{(n+5)} = 256$ है, तो $5^{(n+4)}$ का मान क्या है?

(RRB TECHNICIAN GRADE-3 2024)

[A] 125

[B] 25

[C] 5

[D] 1

$$\begin{array}{c} n+5 \xrightarrow{=} 4 \\ 4 = 4 \end{array}$$

$$\begin{array}{l} n+5=4 \\ \Rightarrow n=-1 \end{array}$$

11. If $(125)^{1.3} \times (25)^{1.8} \div (5)^{2.5} = 5^x$, then find the value of $18x - 5$.

यदि $(125)^{1.3} \times (25)^{1.8} \div (5)^{2.5} = 5^x$ है, तो $18x - 5$ का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2026)

[A] 85

[B] 95

[C] 80

[D] 90

$$(5^3)^{1.3}$$

$$5^{3.9} \times 5^{3.6} \div 5^{2.5}$$

$$= 5^{3.9+3.6-2.5}$$

$$5^{\textcircled{5}} = 5^{\textcircled{20}}$$

$$a^m \div a^n = a^{m-n}$$

12. If $\left(\frac{x}{y}\right)^{5a-3} = \left(\frac{y}{x}\right)^{17-3a}$, what is the value of a ?

यदि $\left(\frac{x}{y}\right)^{5a-3} = \left(\frac{y}{x}\right)^{17-3a}$ तो a का मान क्या है?

[RRB Group-D 2022]

[A] -6

[C] -7

[B] -5

[D] -8

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

$$\left(\frac{x}{y}\right)^{5a-3} = \left(\frac{y}{x}\right)^{3a-17}$$

$$5a-3 = 3a-17$$

$$a = -7$$

13. If $\left(\frac{25}{9}\right)^{x+1} \times \left(\frac{81}{625}\right)^{x-1} = \frac{9}{25}$, then find the value of 'x'.

यदि $\left(\frac{25}{9}\right)^{x+1} \times \left(\frac{81}{625}\right)^{x-1} = \frac{9}{25}$ है, तो x का मान ज्ञात कीजिए।

RRB Group D- 2022

[A] 8

[B] 6

[C] 5

[D] 4

$$\left(\frac{9}{25}\right)^{x+1} \times \left(\frac{9}{25}\right)^{x-1} = \left(\frac{9}{25}\right)^1$$

$$x-3=1$$

$$x=4$$

$$-\frac{19}{9} = \partial \eta$$

15. If $3^{x+y}=81$ and $81^{x-y}=3$ then $x \times y=?$

अगर $3^{x+y}=81$ और $81^{x-y}=3$ है, तो $x \times y=?$

[A] $\frac{255}{64}$

[B] $\frac{125}{32}$

$= \frac{17}{8} \times \frac{15}{8}$

[C] $\frac{240}{64}$

[D] none

$3^{x+y} = 3^4$

~~$(3^4)^{x-y} = 3^1$~~

$x+y=4$

$x-y=\frac{1}{4}$

$x=\frac{17}{4}$ $y=\frac{15}{4}$

16. If $5^{x+y} = 3125$ and $3^{3x-y} = 2187$, then the value of $41x - 32y$ is:
 यदि $5^{x+y} = 3125$ और $3^{3x-y} = 2187$ है, तो $41x - 32y$ का मान ज्ञात कीजिए।

[RRB Group D- 2025]

[A] 57

[C] 59

[B] 53

[D] 55

$$123-64 = 59$$

$$5^{x+y} = 5^5$$

$$3^{3x-y} = 3^7$$

$$\begin{aligned} 5^5 &= 3125 \\ 3^7 &= 2187 \end{aligned}$$

$$\begin{aligned} x+y &= 5 \\ 3x-y &= 7 \\ \hline 4x &= 12 \\ x &= 3 \times y = 2 \end{aligned}$$

17. If $3^{\left(\frac{x^4+x^2+1}{x^2+x+1}\right)} = 3^{(2x+5)}$, then find the positive value of x.

यदि $3^{\left(\frac{x^4+x^2+1}{x^2+x+1}\right)} = 3^{(2x+5)}$, तो x का धनात्मक मान ज्ञात कीजिए।

[RRB Group- D 2025]

[A] 6

[C] 4

[B] 5

[D] 8

$$x^2 - 3x = 4$$

$$16 - 12 = 4$$

$$\frac{x^4 + x^2 + 1}{x^2 + x + 1} = 2x + 5$$

$$x^2 - x + 1 = 2x + 5$$

$$x^4 + x^2 + 1 = (x^2 + x + 1)(x^2 - x + 1)$$



18. 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 the value of $\sqrt{2-42x}$ is:

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।
 $\quad \quad \quad = \sqrt{2-23}$

[A] 5

[B] 6

[C] 3

[D] 4

$$3 \times (2x+3) \times \frac{-3}{4} = \frac{2}{3} \times (3x+7) \times \frac{-6}{5}$$

$$\left(\left(\frac{2}{3} \right)^3 \right)^{2x+3} = \left(\frac{2}{3} \right)^{2(3x+7)}$$

$$30x + 135 = 48x + 112$$

$$48x = -23$$

19. If $5.12 \times 50625 \times 0.5488 = 2^a 3^b 5^c 7^d$, then find the value of $a + b + c + d$.
 यदि $5.12 \times 50625 \times 0.5488 = 2^a 3^b 5^c 7^d$ है, तो $a + b + c + d$ का मान ज्ञात कीजिए।

[RRB Group- D 2025]

[A] 17

[B] 23

[C] 12

[D] 14

$$125 \times 8 = 1000$$

$$625 \times 8 = 5000$$

$$2^9 \times 5^4 \times 3^4 \times 2^4 \times 7^3 \times 10^6$$

$$2^9 \times 3^4 \times 7^3 \times 2^{-2} \times 5^{-2}$$

$$625 \times 8$$

$$10^{-2}$$

$$(2 \times 5)^{-2}$$

$$5488 = 8 \times 686$$

$$= 2^3 \times 7^3$$

$$\sqrt{a^2 + b^2 - 2ab}$$

$$a - b, (a > b)$$

$$b - a, (b > a)$$

$$(a - b)^2 = (b - a)^2 = a^2 + b^2 - 2ab$$

$$\sqrt{7 - 4\sqrt{3}} =$$

$$\sqrt{99 - 70\sqrt{2}} =$$

$$\sqrt{37 - 20\sqrt{3}} =$$

$$(a + b)^2 = a^2 + b^2 + \overset{\text{DIFF}}{2ab}$$

$$(3 + \sqrt{5})^2 = \underbrace{(3^2 + \sqrt{5}^2)}_{\text{integer}} + (2 \times 3 \times \sqrt{5}) = 14 + 6\sqrt{5}$$

$$\begin{aligned} \sqrt{14 + 6\sqrt{5}} &= \sqrt{14 + 2 \times 3 \times \sqrt{5}} \\ &= \sqrt{3^2 + \sqrt{5}^2 + 2 \times 3 \times \sqrt{5}} \\ &= \sqrt{(3 + \sqrt{5})^2} = 3 + \sqrt{5} \end{aligned}$$

Integer
irrational

$$3^2 + \sqrt{5}^2 = 18$$

3 integer + $\sqrt{5}$ irrational

- $(3 + \sqrt{5})^2$

$$(a \pm b)^2 = a^2 + b^2 \pm 2ab$$

- $\sqrt{14 + 6\sqrt{5}} = \sqrt{14 + 2 \times 3 \times \sqrt{5}} = 3 + \sqrt{5}$

- $\sqrt{9 + 4\sqrt{5}} = \sqrt{9 + 2 \times 2 \times \sqrt{5}} = 2 + \sqrt{5}$

- $\sqrt{55 + 14\sqrt{6}} = \sqrt{55 + 2 \times 7 \times \sqrt{6}} = 7 + \sqrt{6}$

- $\sqrt{91 + 6\sqrt{10}} = \sqrt{91 + 2 \times 3\sqrt{10} \times 1} = 3\sqrt{10} + 1$

$$(+5)^2 = (-5)^2 = 25$$

$$\sqrt{a^2 + b^2 - 2ab} =$$

$$(a - b), (a > b)$$

$$(b - a), (b > a)$$

$$(a - b)^2 = (b - a)^2 = a^2 + b^2 - 2ab$$

$$\sqrt{7 - 4\sqrt{3}} =$$

$$2 \times 2 \times \sqrt{3}$$

$$= 2 - \sqrt{3}$$

$$\sqrt{99 - 70\sqrt{2}} =$$

$$2 \times 7 \times 5\sqrt{2}$$

$$= 5\sqrt{2} - 7$$

$$49 + 50$$

$$\sqrt{37 - 20\sqrt{3}} =$$

?

$$= 5 - 2\sqrt{3}$$

20. find the square root of
निम्न का वर्गमूल ज्ञात कीजिए

[A] $7 + 4\sqrt{3}$

~~[B] $4 + \sqrt{15}$~~

[C] $61 + 28\sqrt{3}$

[D] $139 - 80\sqrt{3}$

$$\sqrt{4 + \sqrt{15}} = \sqrt{\frac{8 + 2\sqrt{15}}{2}} = \frac{\sqrt{5 + \sqrt{3}}}{\sqrt{2}}$$

$2 \times \sqrt{5} \times \sqrt{3}$

21. If $\sqrt{3} = 1.732$, then $\sqrt{4 - 2\sqrt{3}}$ is nearest to which of the following option?
अगर $\sqrt{3} = 1.732$, तब $\sqrt{4 - 2\sqrt{3}}$ निम्नलिखित में से कौन-से विकल्प के सबसे निकट है?

(DELHI POLICE CONSTABLE Executive 2025)

[A] 0.542

[B] 0.732

[C] 0.652

[D] 0.432

$$\begin{aligned}\sqrt{4 - 2\sqrt{3}} &= \sqrt{3} - 1 \\ &= 1.732 - 1\end{aligned}$$

22. $\sqrt{6 - \sqrt{35}} = ?$

[A] $\frac{1}{\sqrt{2}}(\sqrt{7} - \sqrt{5})$

[C] $\frac{1}{4}(\sqrt{7} - \sqrt{5})$

[B] $\frac{1}{\sqrt{2}}(\sqrt{5} - \sqrt{7})$

[D] $\frac{1}{4}(\sqrt{7} + \sqrt{3})$

$$\sqrt{\frac{12 - 2\sqrt{35}}{2}}$$

23. If $x = \sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{7 + 4\sqrt{3}}}}$, where $x > 0$, then the value of x is equal to:

यदि $x = \sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{7 + 4\sqrt{3}}}}$, जहां $x > 0$ है, तो x का मान ज्ञात कीजिए।

[A] 2
[C] 4

[B] 3
[D] 1

$$\sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{7 + 4\sqrt{3}}}}$$

$$\sqrt{7 + 2 \times 2 \times \sqrt{3}} = 2 + \sqrt{3}$$

$$= \sqrt{-\sqrt{3} + 4 + \sqrt{3}} \\ = 2$$

24. If $(a + b\sqrt{3})^2 = 52 + 30\sqrt{3}$, where a and b natural numbers, then $a+b$ equals?

यदि $(a + b\sqrt{3})^2 = 52 + 30\sqrt{3}$, जहां a और b प्राकृतिक संख्याएं हैं, तो $a+b$ बराबर है?

[A] 9

[B] 7

[C] 8

[D] 10

5+3

$$a + b\sqrt{3} = \sqrt{52 + 30\sqrt{3}}$$

$2 \times 5 \times 3 \sqrt{3}$

$$a + b\sqrt{3} = 5 + 3\sqrt{3}$$

$$5^2 + (3\sqrt{3})^2 = 52$$

25. If $\sqrt{10 - 2\sqrt{21}} + \sqrt{8 + 2\sqrt{15}} = \sqrt{a} + \sqrt{b}$, where a and b are positive integers, then the value of $\sqrt{ab}$ is closest to:

यदि $\sqrt{10 - 2\sqrt{21}} + \sqrt{8 + 2\sqrt{15}} = \sqrt{a} + \sqrt{b}$, जहाँ a और b धनात्मक पूर्णांक हैं, तो $\sqrt{ab}$ का मान निकटतम है: $\sqrt{35} \approx$

[A] 5.9

[B] 6.8

[C] 4.6

[D] 7.2

$$\sqrt{7} - \sqrt{3} + \sqrt{5} + \sqrt{3}$$

$$\sqrt{7} + \sqrt{5} = \sqrt{10} + \sqrt{6}$$