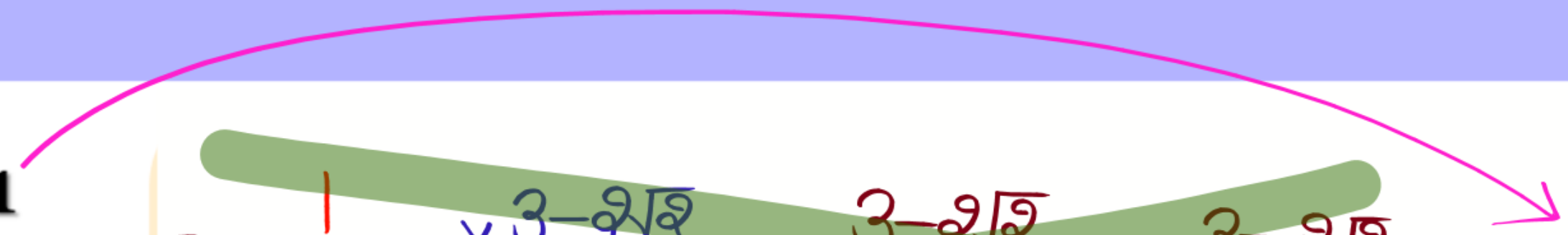



$$\frac{1}{3+2\sqrt{2}} = \frac{3-2\sqrt{2}}{1}$$

$$9-8$$

**Rationalisation (परिमेय करण):**→


$$\frac{1}{3+2\sqrt{2}} = \frac{1}{3+2\sqrt{2}} \times \frac{3-2\sqrt{2}}{3-2\sqrt{2}} = \frac{3-2\sqrt{2}}{3^2-(2\sqrt{2})^2} = \frac{3-2\sqrt{2}}{9-8} = 3-2\sqrt{2}$$

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

$$\frac{1}{5\sqrt{5} \oplus 7\sqrt{2}} = \frac{5\sqrt{5} - 7\sqrt{2}}{27}$$

$$125 - 98$$

$$\frac{1}{8 \ominus 3\sqrt{7}} = \frac{8 + 3\sqrt{7}}{1}$$

$$\frac{1}{7 \oplus 5\sqrt{2}} = \frac{7 - 5\sqrt{2}}{-1} = 5\sqrt{2} - 7$$

$$49 - 50 = -1$$

26. The value of  $\frac{14}{\sqrt{43+30\sqrt{2}}}$  is closet to:

$$\sqrt{2} \approx 1.414$$

$$\sqrt{3} \approx 1.732$$

$\frac{14}{\sqrt{43+30\sqrt{2}}}$  का मान इनमें से किसके निकटतम है-

[A] 1.762

[A] 1.823

[D] 1.414

[D] 1.516

$$25/18$$

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

$$= \frac{14 \times (5-3\sqrt{2})}{7}$$

$$= 10-6\sqrt{2} \approx 10-8.484 = 1.516$$

$$\sqrt{43+2 \times 5 \times 3\sqrt{2}} = 5+3\sqrt{2}$$

$$25+18=43$$

27. What is  $\frac{1}{\sqrt{10}+\sqrt{9}} + \frac{1}{\sqrt{11}+\sqrt{10}} + \frac{1}{\sqrt{12}+\sqrt{11}} + \dots + \frac{1}{\sqrt{196}+\sqrt{195}}$  equal to?

$\frac{1}{\sqrt{10}+\sqrt{9}} + \frac{1}{\sqrt{11}+\sqrt{10}} + \frac{1}{\sqrt{12}+\sqrt{11}} + \dots + \frac{1}{\sqrt{196}+\sqrt{195}}$  बराबर क्या है?

(UPSC CDS-2 2024)

[A] 17

[B] 14

[C] 11

[D] 10

$$= \cancel{\sqrt{10}} - \cancel{\sqrt{9}} + \cancel{\sqrt{11}} - \cancel{\sqrt{10}} + \cancel{\sqrt{12}} - \cancel{\sqrt{11}} + \dots + \sqrt{196} - \sqrt{195}$$

$$= -3 + 14 = 11$$

$$\frac{1}{\sqrt{10} + \sqrt{9}} = \frac{\sqrt{10} - \sqrt{9}}{1}$$

28. If the value of  $\sqrt{40}$  is approximately equal to 6.325, then the value of  $\sqrt{\frac{8}{5}}$  is equal to which of the following?

यदि  $\sqrt{40}$  का मान 6.325 के लगभग बराबर है, तो  $\sqrt{\frac{8}{5}}$  का मान इनमें से किसके बराबर है?

**RRB NTPC 2021**

[A] 2.828

[B] 0.565

[C] 1.26

[D] 1.625

$$\sqrt{\frac{8 \times 5}{5 \times 5}} = \frac{\sqrt{40}}{5} = \frac{6.325}{5} = 1.265$$

29. If  $\sqrt{7} = 2.6457$  and  $\sqrt{3} = 1.732$ , then find the value of  $\frac{1}{\sqrt{7}-\sqrt{3}}$ .  
 यदि  $\sqrt{7} = 2.6457$  और  $\sqrt{3} = 1.732$  हो, तो  $\frac{1}{\sqrt{7}-\sqrt{3}}$  का मान ज्ञात कीजिए।

**RRB RPF Constable-2019**

[A] 1.0944

[B] 1.944

[C] 1.009

[D] 1.0844

$$\frac{1}{\sqrt{7}-\sqrt{3}} = \frac{\sqrt{7}+\sqrt{3}}{4} = \frac{1.0944}{4.3777} = \frac{1.0944}{4}$$

30. If  $\frac{8+2\sqrt{3}}{3\sqrt{3}+5} = a\sqrt{3} - b$ , then the value of  $a + b$  is equal to:

यदि  $\frac{8+2\sqrt{3}}{3\sqrt{3}+5} = a\sqrt{3} - b$  है, तो  $a + b$  का मान ज्ञात कीजिए।

[A] 18

[C] 16

[B] 15

[D] 24

$$\frac{8+2\sqrt{3}}{3\sqrt{3}+5} \times \frac{3\sqrt{3}-5}{3\sqrt{3}-5}$$

$$27-25 = 2$$

$$(4+\sqrt{3}) \cdot (3\sqrt{3}-5)$$

$$7\sqrt{3}-11 = 2\sqrt{3}-6$$



#



31. The value of  $\sqrt{17 + \sqrt{57 + \sqrt{45 + \sqrt{7 + \sqrt{81}}}}}$  is:

$\sqrt{17 + \sqrt{57 + \sqrt{45 + \sqrt{7 + \sqrt{81}}}}}$  का मान क्या है?

[A] 7  
 [C] 1  
 [B] 5  
 [D] 2

32. Find the value of the following.  
निम्न का मान ज्ञात कीजिए।

$$\sqrt{\left( \underline{31} + \sqrt{\left( 15 + \sqrt{\left( 97 + \sqrt{\left( 7 + \sqrt{(4)} \right)} \right)} \right)} \right)}$$

(RRB NTPC 12<sup>TH</sup> LEVEL CBT-2 2025)

[A] ~~5~~

[B] ~~9~~

[C] ~~4~~

[D] 6

33. Solve  $\sqrt{21 + \sqrt[3]{59 + \sqrt{16 + \sqrt[3]{722 + \sqrt{49}}}}}$ ?

[RPF CONSTABLE 2025]

[A] 4

[C] 6

[B] 5

[D] 7

**34. Simplify the following?**  
**निम्नलिखित को सरल कीजिये?**

$$\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$$

$$\sqrt{16 + 19.25 \times 4^2}$$

[A] 7/18

[C] 2/9

[B] 1/9

[D] 5/18

$$\sqrt{16 \times 40.25}$$

$$= 4 \times 4.5$$

$$\frac{4}{4 \times 4.5} = \frac{1}{4.5}$$

35. Let  $x = \sqrt[6]{27} - \sqrt{6\frac{3}{4}}$  and  $y = \frac{\sqrt{45} + \sqrt{605} + \sqrt{245}}{\sqrt{80} + \sqrt{125}}$ , then the value of  $x^2 + y^2$  is :

यदि  $x = \sqrt[6]{27} - \sqrt{6\frac{3}{4}}$  और  $y = \frac{\sqrt{45} + \sqrt{605} + \sqrt{245}}{\sqrt{80} + \sqrt{125}}$  है, तो  $x^2 + y^2$  का मान क्या होगा?

[A]  $\frac{227}{9}$

[C]  $\frac{221}{9}$

[B]  $\frac{221}{36}$

[D]  $\frac{223}{36}$

$\frac{3}{4} + \frac{49}{9} = \frac{223}{36}$

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

$y = \frac{3+11+7}{4+5}$

$\sqrt[6]{27} = (3)^{\frac{1}{6}} = 3^{\frac{1}{2}} = \sqrt{3}$

$y = \frac{21}{9} = \frac{7}{3}$

$\sqrt{6\frac{3}{4}} = \sqrt{\frac{27}{4}} = \frac{3\sqrt{3}}{2}$



**36. Find the value of  $\left(\frac{1}{7}\right)^{-4} + \left(\frac{1}{9}\right)^{-4} + \left(\frac{1}{5}\right)^{-4}$ .**

$\left(\frac{1}{7}\right)^{-4} + \left(\frac{1}{9}\right)^{-4} + \left(\frac{1}{5}\right)^{-4}$  का मान ज्ञात करें।

**RRB Constable 2025**

[A] 9584

[C] 9587

[B] 9578

[D] 9596

$$\left(\frac{1}{a}\right)^{-n} = a^n$$

$$7^4 + 9^4 + 5^4$$

$$\begin{array}{r} 2401 \\ 6561 \\ + 625 \\ \hline \end{array}$$

$$81^2 = 6561$$

37. Find the value of/निम्नलिखित का मान ज्ञात कीजिए।

$$\left[ \left( \frac{7}{6} \right)^{-9} \times \left( \frac{6}{7} \right)^{-5} \times \left( \frac{1}{8} \right)^{-4} \right]^{-5}$$

**RRB Constable 2025**

~~[A]  $\left( \frac{7}{48} \right)^{20}$~~

~~[B]  $\left( \frac{9}{48} \right)^{19}$~~

~~[C]  $\left( \frac{48}{7} \right)^{22}$~~

~~[D]  $\left( \frac{7}{58} \right)^{20}$~~

$$7^{-9} \times 7^5 = \left( \frac{-4}{7} \right)^{-5} = 7^{20}$$

38. **Simplify/निम्न को सरल करें।**

$$\sqrt{\frac{1764}{2025}} \times \sqrt{\frac{625}{441}} - \left(\frac{3}{4}\right)^{-2}$$

**(RRB NTPC 12<sup>TH</sup> LEVEL CBT-2 2025)**

[A]  $-\frac{1}{3}$   
 [C]  $-\frac{2}{3}$

[B]  $\frac{26}{9}$   
 [D]  $-\frac{22}{63}$

$$\frac{2 \times 25}{9 \times 45} - \left(\frac{4}{3}\right)^2$$

$$\frac{10}{9} - \frac{16}{9} = -\frac{6}{9} = -\frac{2}{3}$$

39. Simplify the expression given below./को सरल कीजिए।

$$\cancel{3^5} - \left(\frac{1}{3}\right)^{-5} + \sqrt{\frac{27^{12} + 9^{13}}{27^6 + 9^{14}}}$$

(RRB NTPC 12<sup>TH</sup> LEVEL CBT-2 2025)

[A] 243

[B] 27

[C] 69

[D] 81

$$3^5 - 3^5$$

$$\sqrt{\frac{3^{36} + 3^{26}}{3^{18} + 3^{28}}}$$

$$= \sqrt{\frac{3^{26} \cdot (3^{10} + 1)}{3^{18} \cdot (1 + 3^{10})}}$$

$$= \sqrt{3^8} = 3^4 = 81$$

40. The value of  $\left(\frac{15625}{49}\right)^{-\left(\frac{3}{2}\right)} \times \left(\frac{5}{7}\right)^5 \div \sqrt[4]{(625)^{-3}}$  is.

$\left(\frac{15625}{49}\right)^{-\left(\frac{3}{2}\right)} \times \left(\frac{5}{7}\right)^5 \div \sqrt[4]{(625)^{-3}}$  का मान ज्ञात कीजिए।

[RPF CONSTABLE 2025]

[A]  ~~$\frac{1}{237}$~~

✓ [C]  $\frac{1}{245}$

[B]  ~~$\frac{1}{249}$~~

[D]  ~~$\frac{1}{233}$~~

5 & 7

**41. Find the value of**  $\left\{ \frac{25 \times (4)^{-4}}{(5)^{-3} \times 10 \times (4)^{-8}} \right\} \div \left\{ \frac{(3)^{-5} \times (10)^{-5} \times 125}{(5)^{-7} \times (6)^{-5}} \right\}$  **का मान ज्ञात कीजिए।**  
**[RRB Group D 2025]**

**[A]**  ~~$\frac{73}{4}$~~   
**[C]**  ~~$\frac{149}{9}$~~

**[B]**  ~~$\frac{89}{6}$~~   
**[D]**  $\frac{128}{5}$

$\div 2 \& 5$

42. The value of  $\frac{(2023)^{2024} + (2023)^{2023} + 2024}{(2023)^{2023} + 1}$  is

$\frac{(2023)^{2024} + (2023)^{2023} + 2024}{(2023)^{2023} + 1}$  का मान ज्ञात कीजिए।

[RPF CONSTABLE 2025]

[A] 2023

[B] 2025

[C] 2024

[D] 4047

$$\frac{(2023)^{2023} \{2023 + 1\} + 2024}{2023^{2023} + 1} = 2024 \times \frac{2023}{2023 + 1}$$



$$\text{माना } x = \sqrt{a+\sqrt{b}} \pm \sqrt{a-\sqrt{b}}$$

$$x^2 = \text{निर्धारित}$$



**43. Find the value of  $\sqrt{2 + \sqrt{3}} + \sqrt{2 - \sqrt{3}}$ .**

$\sqrt{2 + \sqrt{3}} + \sqrt{2 - \sqrt{3}}$  का मान ज्ञात कीजिए।

☒ [A]  $\sqrt{6}$

[B]  $2\sqrt{3}$

[C]  $2\sqrt{2}$

[D] 6

$$\text{माना } x = \left( \sqrt{2 + \sqrt{3}} + \sqrt{2 - \sqrt{3}} \right)^2$$

$$x = (2 + \cancel{\sqrt{3}}) + (2 - \cancel{\sqrt{3}}) + 2 \times \sqrt{4 - 3}$$

$$x = 6$$

$$x = \sqrt{6}$$

44. Simplify  $\sqrt{25 + 10\sqrt{6}} + \sqrt{25 - 10\sqrt{6}}$  ?

सरल कीजिये  $\sqrt{25 + 10\sqrt{6}} + \sqrt{25 - 10\sqrt{6}}$  ?

RRB JE 2019

[A]  $2\sqrt{15}$

[B]  $2\sqrt{5}$

[C]  $\sqrt{55}$

[D]  $\sqrt{50}$

माना  $x = \left( \sqrt{25 + 10\sqrt{6}} + \sqrt{25 - 10\sqrt{6}} \right)^2$

$25 - 600$

$$x = (25 + \cancel{10\sqrt{6}}) + (25 - \cancel{10\sqrt{6}}) + 2 \times \sqrt{25}$$

$$x = 60 \Rightarrow x = \sqrt{60} = 2\sqrt{15}$$

45. If  $x = \sqrt{1 + \frac{\sqrt{3}}{2}} - \sqrt{1 - \frac{\sqrt{3}}{2}}$  then the value of  $\frac{\sqrt{3}-x}{\sqrt{3}+x}$  (correct to one decimal place) is?

यदि  $x = \sqrt{1 + \frac{\sqrt{3}}{2}} - \sqrt{1 - \frac{\sqrt{3}}{2}}$  तो  $\frac{\sqrt{3}-x}{\sqrt{3}+x}$  का मान क्या होगा (दशमलव के एक स्थान तक सही)?

[A] 0.25

[B] 0.17

[C] 0.19

[D] 0.27

$$\frac{\sqrt{3}-1}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1} = \frac{(\sqrt{3}-1)^2}{2}$$

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

$$x^2 = 1$$

$$x = 1$$

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

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

$$\approx 2 - 1.732$$