

Algebra sheet-2



यदि $x^n = a$

तो $x = a^{\frac{1}{n}}$

यदि $5^{\cancel{a}} = k$

तो $5 = k^{\frac{1}{a}}$

$$a^m \times a^n = a^{m+n}$$

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



Basic →

If, $5^a = 7^b = 35^c$

$5^a = 7^b = 35^c = K$ (माना)

$5 = K^{\frac{1}{a}}$

$7 = K^{\frac{1}{b}}$

$35 = K^{\frac{1}{c}}$

तो $C = \frac{ab}{a+b}$ ✓

$5 \times 7 = 35$

$K^{\frac{1}{a}} \times K^{\frac{1}{b}} = K^{\frac{1}{c}}$

$\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$

✓ ⇒ $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$
 $\frac{b+a}{ab} = \frac{1}{c}$

Trick :->

यदि

$$\overset{a}{5} = \overset{b}{7} = \overset{c}{35}$$

रिश्ता खोजो

$$\overset{1}{5} \times \overset{1}{7} = \overset{1}{35}$$

$$\Rightarrow \frac{1}{a} + \frac{1}{b} = \frac{1}{c}$$

$$c = \frac{ab}{a+b}$$

1. **If $7^a = 11^b = 77^c$, then find value of c =?**

यदि $7^a = 11^b = 77^c$, तो c का मान ज्ञात कीजिए ?

☒ [A] $\frac{ab}{a+b}$

[C] $\frac{ab}{a-b}$

[B] $\frac{a+b}{ab}$

[D] $\frac{a+b}{a-b}$

2. If $2^x = 3^y = 72^z$, then $\frac{4xy}{2x+3y} = ?$

यदि $2^x = 3^y = 72^z$ है, तो $\frac{4xy}{2x+3y} = ?$

[A] $4z$

[B] $\frac{4}{z}$

[C] $2z$

[D] $\frac{3}{z}$

$\textcircled{3} \times \textcircled{2} = \textcircled{1}$
 $2 \times 3 = 72$

$\frac{4xy}{2x+3y} = 4z$



$\frac{3}{2} + \frac{2}{3} = \frac{1}{z}$
 $\frac{3y+2x}{6y} = \frac{1}{z}$

4. If $2^x = 3^y = 18^{-z}$, then which option is correct?

यदि $2^x = 3^y = 18^{-z}$ है, तो कौन सा विकल्प सही है?

☒ [A] $\frac{1}{x} + \frac{2}{y} + \frac{1}{z} = 0$

[B] $\frac{2}{x} + \frac{1}{y} + \frac{1}{z} = 0$

[C] $\frac{1}{x} + \frac{2}{y} - \frac{1}{z} = 0$

[D] $\frac{1}{x} - \frac{2}{y} + \frac{1}{z} = 0$

$$2^1 \times 3^2 = 18^1$$

$$\frac{1}{x} + \frac{2}{y} = \frac{1}{-z}$$

$$\frac{1}{x} + \frac{2}{y} + \frac{1}{z} = 0$$

3. If a, b, c are non-zero numbers and $14^a = 36^b = 84^c$, then $6b \left(\frac{1}{c} - \frac{1}{a} \right)$ is equal to?

यदि a, b, c गैर-शून्य संख्याएँ हैं और $14^a = 36^b = 84^c$ हैं तो $6b \left(\frac{1}{c} - \frac{1}{a} \right)$ बराबर है?

[A] 6

[C] 4

[B] 3

[D] 1.5

$$6b \times \frac{1}{2b} = 3$$

$$\Rightarrow 14^1 \times 36^{\frac{1}{2}} = 84^1$$

$$14 \times 6 = 84$$

$$6 = \sqrt{36}$$

$$\frac{1}{a} + \frac{1}{2b} = \frac{1}{c}$$

$$\frac{1}{2b} = \frac{1}{c} - \frac{1}{a}$$

5. If $(5.55)^x = (0.555)^y = 1000$, then the value of $\frac{1}{x} - \frac{1}{y}$ is

यदि $(5.55)^x = (0.555)^y = 10^3$, फिर $\frac{1}{x} - \frac{1}{y}$ का मान है

[A] 3

[B] 1

[C] $\frac{1}{3}$

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

$$\begin{array}{l} 5.55 = \frac{555}{100} \\ \cdot 555 = \frac{555}{1000} \end{array}$$

$$1 = \frac{3}{x} - \frac{3}{y}$$

$$\frac{1}{3} = \frac{1}{x} - \frac{1}{y}$$

$$\Rightarrow \frac{1}{10} = \frac{3}{x} - \frac{3}{y}$$

2.

$$(ax + by)^2 + (ay - bx)^2 = (a^2 + b^2) \cdot (x^2 + y^2)$$

$$\text{L.H.S} = a^2x^2 + b^2y^2 + \cancel{2abxy} + a^2y^2 + b^2x^2 - \cancel{2abxy}$$

$$= a^2(\underline{x^2 + y^2}) + b^2(\underline{y^2 + x^2})$$

$$= (x^2 + y^2) \cdot (a^2 + b^2)$$

$$\text{L.H.S} = \text{R.H.S}$$



6. If $a^2 + b^2 = 25$, $x^2 + y^2 = 17$ and $ax + by = 8$, then $ay - bx = ?$

यदि $a^2 + b^2 = 25$, $x^2 + y^2 = 17$ और $ax + by = 8$ है, तो $ay - bx$ ज्ञात कीजिए?

(SSC CHSL PRE 2020)

[A] 20

[B] 17

[C] 18

~~[D] 19~~

$$(ax + by)^2 + (ay - bx)^2 = (a^2 + b^2) \cdot (x^2 + y^2)$$

$$8^2 + ?^2 = 25 \times 17$$

$$?^2 = 425 - 64 = 361$$

$$? = 19$$

③

If, $a \times b = 1$ तो $\frac{1}{1+a^n} + \frac{1}{1+b^n} = 1$

$$\rightarrow b = \frac{1}{a}$$

$$\begin{aligned} & \frac{1}{1+a^n} + \frac{1}{1+\frac{1}{a^n}} \\ & \frac{1}{1+a^n} + \frac{a^n}{a^n+1} \\ & = \frac{\cancel{1+a^n}}{\cancel{1+a^n}} = 1 \end{aligned}$$

if, $a = \frac{\sqrt{10} + \sqrt{7}}{\sqrt{10} - \sqrt{7}}$

$$b = \frac{\sqrt{10} - \sqrt{7}}{\sqrt{10} + \sqrt{7}}$$

$$a \times b = 1$$

तो $\frac{1}{1+a^2} + \frac{1}{1+b^2} = ①$



$$\text{If, } a = 5 + 2\sqrt{6}$$

$$b = 5 - 2\sqrt{6}$$

$$\begin{aligned} a \times b &= 5^2 - (2\sqrt{6})^2 \\ &= 25 - 24 \\ &= 1 \end{aligned}$$

$$\text{तो } \frac{1}{1+a^{37}} + \frac{1}{1+b^{37}} = 2$$



7. If $P + \frac{1}{p} = 112$, then the value of $(p - 112)^{15} + \left(\frac{1}{p}\right)^{15}$ will be:

यदि $P + \frac{1}{p} = 112$ है, तो $(p - 112)^{15} + \left(\frac{1}{p}\right)^{15}$ का मान होगा:

[A] 0

[C] 112

[B] 1

[D] -1

≠

$$p - 112 = -\frac{1}{p}$$

$$\begin{aligned} & \left(-\frac{1}{p}\right)^{15} + \left(\frac{1}{p}\right)^{15} \\ &= 0 \end{aligned}$$

$$\begin{cases} n = 1 \\ (-1)^{\text{odd}} = -1 \\ (-1)^{\text{even}} = 1 \end{cases}$$

8. If $x + \frac{4\sqrt{3}}{x} = 5$, then $\frac{x^2 + 7x + 4\sqrt{3}}{x^2(5-x)} = ?$

यदि $\cancel{x} \left(x + \frac{4\sqrt{3}}{x} = 5 \right)$ है, तो $\frac{x^2 + 7x + 4\sqrt{3}}{x^2(5-x)} = ?$

[A] $\sqrt{3}$

[B] $2\sqrt{3}$

[C] $3\sqrt{3}$

[D] 2

$$x^2 + 4\sqrt{3} = 5x$$

$$4\sqrt{3} = 5x - x^2$$

$$\frac{12}{x \cdot (5-x)}$$

$$= \frac{12}{5x - x^2} = \frac{12}{4\sqrt{3}} = \sqrt{3}$$

11. If $\frac{11-13x}{x} + \frac{11-13y}{y} + \frac{11-13z}{z} = 5$, then what is the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$?

यदि $\frac{11-13x}{x} + \frac{11-13y}{y} + \frac{11-13z}{z} = 5$, तो $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ का मान क्या है?

[A] 5

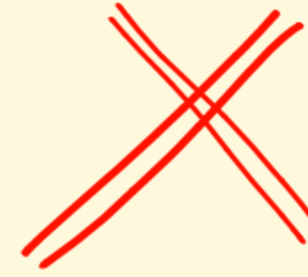
[B] 13/11

[C] 13/5

[D] 4.

$$11\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z}\right) = 44$$

$$\frac{a+b-c}{x} = \frac{a}{x} + \frac{b}{x} - \frac{c}{x}$$



9. If $(3x + 4y)(5x - 6y) = ax^2 + 2hxy + by^2$, then what is the value of $(4a - h + 2b)$?

यदि $(3x + 4y)(5x - 6y) = ax^2 + 2hxy + by^2$ है, तो $(4a - h + 2b)$ का मान कितना होगा?

[A] 13

[B] 107

[C] 108

[D] 11

$$60 - 1 - 48 = 11$$

$$a = 15$$

$$2h = 2 \Rightarrow h = 1$$

$$b = -24$$

10. If $(2x + 3y + 4)(2x + 3y - 5)$ is equivalent to $(ax^2 + by^2 + 2hxy + 2gx + 2fy + c)$, then what is the value of $\{(g + f - c)/abh\}$?

यदि $(2x + 3y + 4)(2x + 3y - 5)$, $(ax^2 + by^2 + 2hxy + 2gx + 2fy + c)$ के समतुल्य है, तो $\{(g + f - c)/abh\}$ का मान ज्ञात कीजिए।

[A] $\frac{37}{216}$
[C] $\frac{19}{108}$

[B] $\frac{19}{216}$
[D] $\frac{35}{432}$

$$\frac{-1 - \frac{3}{2} + 20}{4 \times 9 \times 6}$$

$$a = 4$$

$$b = 9$$

$$2h = 12$$

$$c = -20$$

$$g = -1$$

$$f = -3$$

$$= \frac{35}{216}$$

$$\frac{19 - 3}{2}$$

If, $x + \frac{1}{x} = c + \frac{1}{c}$

तो, $x = c, \frac{1}{c}$

या

$$x + \frac{1}{x} = \left(\frac{1}{c}\right) + \left(\frac{1}{\frac{1}{c}}\right)$$

#5

$$c = \frac{1}{\left(\frac{1}{c}\right)}$$

If, $a + \frac{1}{a} = 7 + \frac{1}{7}$

तो $a = 7, \frac{1}{7}$

12. **If $x + \frac{1}{x} = c + \frac{1}{c}$ then the value of x ?**

यदि $x + \frac{1}{x} = c + \frac{1}{c}$ तो x का मान बताइए?

(SSC CGL Mains 2016)

☒ [A] $c, \frac{1}{c}$

[B] c, c^2

[C] $c, 2c$

[D] $0, 1$

$$\frac{a+b}{a-b} + \frac{a-b}{a+b} = \frac{2(a^2 + b^2)}{(a^2 - b^2)} \quad \checkmark$$

#

Proof:

$$\frac{a+b}{a-b} + \frac{a-b}{a+b} = \frac{(a+b)^2 + (a-b)^2}{(a-b) \cdot (a+b)} = \frac{2(a^2 + b^2)}{(a^2 - b^2)}$$

$$\frac{\sqrt{11} + \sqrt{7}}{\sqrt{11} - \sqrt{7}} + \frac{\sqrt{11} - \sqrt{7}}{\sqrt{11} + \sqrt{7}} = \frac{2 \times (11 + 7)}{11 - 7} = \frac{36}{4} = 9$$





$$\frac{a+b}{a-b} - \frac{a-b}{a+b} = \frac{4ab}{a^2 - b^2}$$

$$\frac{a-b}{a+b} - \frac{a+b}{a-b} = \frac{-4ab}{a^2 - b^2}$$

$$\frac{\sqrt{7}-\sqrt{3}}{\sqrt{7}+\sqrt{3}} - \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}-\sqrt{3}} =$$

$$-\frac{\cancel{4} \times \sqrt{7} \times \sqrt{3}}{\cancel{7-3}} = -\sqrt{21}$$



13. If $x^{150} = \frac{6-\sqrt{21}}{6+\sqrt{21}}$, then $x^{150} + \frac{1}{x^{150}} = ?$

यदि $x^{150} = \frac{6-\sqrt{21}}{6+\sqrt{21}}$ हो तो, $x^{150} + \frac{1}{x^{150}} = ?$

[A] 8.7

[B] 8.6

[C] 6.7

[D] 7.6

$$\frac{6-\sqrt{21}}{6+\sqrt{21}} + \frac{6+\sqrt{21}}{6-\sqrt{21}}$$

$$= \frac{2 \times (36+21)}{(36-21)} = 2 \times \frac{57}{15} = \frac{38}{5}$$

14. If the value of $\frac{3x\sqrt{y}+2y\sqrt{x}}{3x\sqrt{y}-2y\sqrt{x}} - \frac{3x\sqrt{y}-2y\sqrt{x}}{3x\sqrt{y}+2y\sqrt{x}}$ is same as that of $\sqrt{x} \sqrt{y}$

following relations:

$\frac{3x\sqrt{y}+2y\sqrt{x}}{3x\sqrt{y}-2y\sqrt{x}} - \frac{3x\sqrt{y}-2y\sqrt{x}}{3x\sqrt{y}+2y\sqrt{x}}$ का मान $\sqrt{x} \sqrt{y}$ के मान के बराबर है तो x और y के बीच निम्न

[A] $9x - 4y = 36$

[C] $9x + 4y = 36$

[B] $9x + 4y = 24$

[D] $9x - 4y = 24$

$a \rightarrow 3x\sqrt{y}$

$b \rightarrow 2y\sqrt{x}$

$$\frac{4 \times \cancel{3x\sqrt{y}} \times \cancel{2y\sqrt{x}}}{x^2y - 4y^2x} = \cancel{\sqrt{x}\sqrt{y}}$$

$$\frac{\cancel{24xy}}{xy(x-4y)} = 1$$

16. Let $x = \frac{\sqrt{6}+\sqrt{5}}{\sqrt{6}-\sqrt{5}}$ and $y = \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}}$ What is $(x^2 - y^2)$ equal to?

यदि $x = \frac{\sqrt{6}+\sqrt{5}}{\sqrt{6}-\sqrt{5}}$ and $y = \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}}$ तो $(x^2 - y^2)$ किसके बराबर है?

[A] $22\sqrt{30}$

[B] $44\sqrt{30}$

[C] $66\sqrt{30}$

[D] $88\sqrt{30}$

$(x+y) \times (x-y)$

$\frac{9 \times (6+5)}{1} \times \frac{4 \times \sqrt{6} \times \sqrt{5}}{1}$

$= 88\sqrt{30}$

15. If $x = \frac{\sqrt{5}+1}{\sqrt{5}-1}$ and $y = \frac{\sqrt{5}-1}{\sqrt{5}+1}$, then find the value of $x^2 - y^2$.

यदि $x = \frac{\sqrt{5}+1}{\sqrt{5}-1}$ और $y = \frac{\sqrt{5}-1}{\sqrt{5}+1}$ है, तो $x^2 - y^2$ का मान ज्ञात करें।

[A] $\sqrt{5}$

[B] $2\sqrt{5}$

[C] $3\sqrt{5}$

[D] $4\sqrt{5}$

$$\frac{3}{2 \times 6} \times \frac{4\sqrt{5}}{4}$$

17. If $x = \sqrt{6} + 2$ and $y = \sqrt{6} - 2$, then what is the value of $\left(\frac{x}{y} + \frac{y}{x}\right)^2 - 3 = ?$

यदि $x = \sqrt{6} + 2$ और $y = \sqrt{6} - 2$, तो $\left(\frac{x}{y} + \frac{y}{x}\right)^2 - 3$ का मान क्या होगा?

[A] 42

[C] 35

☒ [B] 97 = $10^2 - 3$

[D] 22

$$\frac{\sqrt{6}+2}{\sqrt{6}-2} + \frac{\sqrt{6}-2}{\sqrt{6}+2} = \frac{\cancel{2} \times (6+4)}{\cancel{6}-4} = 10$$



18. If $x = 8 + 3x\sqrt{7}$, $x > 0$, then the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$ is:

यदि $x = 8 + 3\sqrt{7}$, $x > 0$ है, तो $\sqrt{x} - \frac{1}{\sqrt{x}}$ का मान क्या है?

(SSC CGL PRE 2022)

[A] 4

[B] $\sqrt{14}$

[C] 6

[D] $2\sqrt{7}$

19. **If $x = 10 + 3\sqrt{11}$, then find $\sqrt{x} + \frac{1}{\sqrt{x}}$?**

यदि $x = 10 + 3\sqrt{11}$ है, तो $\sqrt{x} + \frac{1}{\sqrt{x}}$ ज्ञात कीजिये?

[A] 4.84

[B] 5.69

[C] 4.69

[D] 3.92

20. If $x + \frac{1}{x} = 13$, then what is the value of $x^2 + \frac{1}{x^2}$?

यदि $x + \frac{1}{x} = 13$ है, तो $(x^2 + \frac{1}{x^2})$ का मान कितना है?

RRB Group-D 2024

[A] 171

[B] 167

[C] 163

[D] 169

21. If $x + \frac{1}{x} = 15$, find the value of $x^2 + \frac{1}{x^2}$.

यदि $x + \frac{1}{x} = 15$ है, तो $x^2 + \frac{1}{x^2}$ का मान ज्ञात कीजिए।

[RRB ALP CBT-1 2025]

[A] 125

[B] 143

[C] 225

[D] 223

22. If $a + \frac{1}{a} = 12$, then the value of $a^2 + \frac{1}{a^2}$.

यदि $a + \frac{1}{a} = 12$ है, तो $a^2 + \frac{1}{a^2}$ का मान ज्ञात करें।

[A] 138

[B] 144

[C] 140

[D] 142

23. If $\sqrt{x} + \frac{1}{\sqrt{x}} = 5$, find $x + \frac{1}{x}$.

यदि $\sqrt{x} + \frac{1}{\sqrt{x}} = 5$, तो $x + \frac{1}{x}$ ज्ञात कीजिए।

[A] 32

[B] 15

[C] 23

[D] 25

- 24. If $\left(x + \frac{1}{x}\right) = 8.5$, what is the value of $\left(x^2 + \frac{1}{x^2}\right)$?**
यदि $\left(x + \frac{1}{x}\right) = 8.5$ है, तो $\left(x^2 + \frac{1}{x^2}\right)$ का मान ज्ञात करें।
- [A] 70.25** **[B] 74.25**
[C] 72.25 **[D] 75.25**

25. If $x^2 + \frac{1}{x^2} = 16$ and $x \neq 0$, then what is the value of $x^4 + \frac{1}{x^4}$.

यदि $x^2 + \frac{1}{x^2} = 16$ और $x \neq 0$ है, तो $x^4 + \frac{1}{x^4}$ का मान ज्ञात कीजिए।

(IB ACIO Grade-2 2023) RRB Technician Grade-3 2025

[A] 254

[B] 260

[C] 258

[D] 252

26. **If** $x^{12.5} + \frac{1}{x^{12.5}} = 16$, **then** $x^{25} + \frac{1}{x^{25}} = ?$

यदि $x^{12.5} + \frac{1}{x^{12.5}} = 16$ **हो तो,** $x^{25} + \frac{1}{x^{25}} = ?$

[A] 254

[B] 258

[C] 260

[D] 256

27. **If** $\frac{x^{42}+1}{x^{21}} = 7$, **then** $\frac{x^{84}+1}{x^{42}} = ?$

यदि $\frac{x^{42}+1}{x^{21}} = 7$ हो तो, $\frac{x^{84}+1}{x^{42}} = ?$

[A] 51

[B] 49

[C] 53

[D] 47

28. If $\frac{x^{200}}{y^{200}} + \frac{y^{200}}{x^{200}} = 8$, then find $\frac{x^{400}}{y^{400}} + \frac{y^{400}}{x^{400}}$?

यदि $\frac{x^{200}}{y^{200}} + \frac{y^{200}}{x^{200}} = 8$ है, तो $\frac{x^{400}}{y^{400}} + \frac{y^{400}}{x^{400}}$ ज्ञात कीजिये?

[A] 60

[B] 62

[C] 64

[D] 66

- 29. If $\left(x - \frac{1}{x}\right) = 7.5$, what is the value of $\left(x^2 + \frac{1}{x^2}\right)$?**
यदि $\left(x - \frac{1}{x}\right) = 7.5$ तो $\left(x^2 + \frac{1}{x^2}\right)$ का मान ज्ञात कीजिए।
- [A] 54.25** **[B] 58.25**
[C] 60.25 **[D] 56.25**

30. If $x - \frac{1}{x} = 0.4$ & $x > 0$, then find $x^2 + \frac{1}{x^2}$?

यदि $x - \frac{1}{x} = 0.4$ & $x > 0$, तो $x^2 + \frac{1}{x^2}$ ज्ञात करें?

[A] 4.16

[B] 3.32

[C] 1.84

[D] 2.16

31. If $x \left(5 - \frac{2}{x} \right) = \frac{5}{x}$, then the value of $x^2 + \frac{1}{x^2}$ is equal to:

यदि $x \left(5 - \frac{2}{x} \right) = \frac{5}{x}$ है तो $x^2 + \frac{1}{x^2}$ का मान है?

[A] $2\frac{4}{25}$

[B] $2\frac{1}{25}$

[C] $3\frac{4}{25}$

[D] $2\frac{3}{25}$

32. If $a^2 - 13a - 1 = 0$, then find the value of $a^2 + \frac{1}{a^2} - 6 = ?$

यदि $a^2 - 13a - 1 = 0$ हो, तो $a^2 + \frac{1}{a^2} - 6$ का मान ज्ञात कीजिए।

[RRB Group D-2022]

[A] 165

[B] 169

[C] 167

[D] 171

33. If $x - 5\sqrt{x} - 1 = 0$, then $x^2 + \frac{1}{x^2}$ is equal to:

यदि $x - 5\sqrt{x} - 1 = 0$ हो तो $x^2 + \frac{1}{x^2}$ का मान होगा?

[A] 625

[B] 731

[C] 729

[D] 727

34. If $P = 7 + 4\sqrt{3}$ and $PQ = 1$, then what is the value of $\left(\frac{1}{P^2}\right) + \left(\frac{1}{Q^2}\right) = ?$

यदि $P = 7 + 4\sqrt{3}$ तथा $PQ = 1$ है तो $\left(\frac{1}{P^2}\right) + \left(\frac{1}{Q^2}\right)$ का मान क्या है?

[A] 148

[B] 189

[C] 194

[D] 204

35. If $x^{2019} = 11 - 2\sqrt{30}$, then $x^{4038} + \frac{1}{x^{4038}} = ?$

यदि $x^{2019} = 11 - 2\sqrt{30}$ हो तो, $x^{4038} + \frac{1}{x^{4038}} = ?$

[A] 443

[B] 439

[C] 486

[D] 482

36. If, $p = \frac{\sqrt{5}-2}{\sqrt{5}+2}$ and $q = \frac{\sqrt{5}+2}{\sqrt{5}-2}$, then what is $\left(\frac{p}{q} + \frac{q}{p}\right)$ equal to?

यदि, $p = \frac{\sqrt{5}-2}{\sqrt{5}+2}$ और $q = \frac{\sqrt{5}+2}{\sqrt{5}-2}$ है, तो $\left(\frac{p}{q} + \frac{q}{p}\right)$ किसके बराबर है?

(UPSC CDS - II 2025)

[A] 18

[B] $8\sqrt{5}$

[C] 322

[D] $72\sqrt{5}$

37. If $x = \frac{\sqrt{5}+2}{\sqrt{5}-2}$ and $y = \frac{\sqrt{5}-2}{\sqrt{5}+2}$, then find the value of $x^2 + y^2$.

यदि $x = \frac{\sqrt{5}+2}{\sqrt{5}-2}$ और $y = \frac{\sqrt{5}-2}{\sqrt{5}+2}$ है, तो $x^2 + y^2$ का मान ज्ञात कीजिए।

[A] 312

[B] 311

[C] 322

[D] 302

38. If $a = \frac{3+\sqrt{5}}{3-\sqrt{5}}$ and $b = \frac{3-\sqrt{5}}{3+\sqrt{5}}$, find the value of $a^2 + b^2 + 3ab$.

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

RRB NTPC Graduate Level CBT-1 2025

[A] 42

[B] 50

[C] 98

[D] 78

39. **If $x + \frac{1}{x} = 9$, then find $x^4 + \frac{1}{x^4}$.**

यदि $x + \frac{1}{x} = 9$ है, तो $x^4 + \frac{1}{x^4}$ का मान ज्ञात करें।

SSC CGL 2023 PRE

[A] 5431

[B] 6561

[C] 6156

[D] 6239

40. If $x\sqrt{x} + \frac{1}{x\sqrt{x}} = 7$, then $x^6 + \frac{1}{x^6} = ?$

यदि $x\sqrt{x} + \frac{1}{x\sqrt{x}} = 7$ हो तो, $x^6 + \frac{1}{x^6} = ?$

[A] 2401

[B] 2207

[C] 2399

[D] 2211

41. If $x - \frac{1}{x} = 3$, then the value of $x^4 + \frac{1}{x^4}$ is:

यदि $x - \frac{1}{x} = 3$ है, तो $x^4 + \frac{1}{x^4}$ का मान ज्ञात कीजिए।

[A] 19

[B] 196

[C] 176

[D] 119

42. If $x - \frac{1}{x} = 11$, what is the value of $\left(x^4 + \frac{1}{x^4}\right)$?

यदि $x - \frac{1}{x} = 11$ है, तो $\left(x^4 + \frac{1}{x^4}\right)$ का मान क्या होगा?

[A] 14159

[B] 14163

[C] 15127

[D] 15131

43. **If $x^{1.08\sqrt{2}} - \frac{1}{x^{1.08\sqrt{2}}} = \sqrt{5}$, then find $x^{4.32\sqrt{2}} + \frac{1}{x^{4.32\sqrt{2}}}$?**

यदि $x^{1.08\sqrt{2}} - \frac{1}{x^{1.08\sqrt{2}}} = \sqrt{5}$ है, तो $x^{4.32\sqrt{2}} + \frac{1}{x^{4.32\sqrt{2}}}$ ज्ञात कीजिये?

[A] 45

[B] 47

[C] 7

[D] 11

44. If $\sqrt{x} - \frac{1}{\sqrt{x}} = 7$, then $x^2 + \frac{1}{x^2}$ is equal to:

यदि $\sqrt{x} - \frac{1}{\sqrt{x}} = 7$, है, तो $x^2 + \frac{1}{x^2}$ का मान होगा?

[A] 2599

[B] 2603

[C] 2508

[D] 2560

45. If $\sqrt{x} + \frac{1}{\sqrt{x}} = 3$, $x > 0$, then $x^2(x^2 - 47) = ?$

यदि $\sqrt{x} + \frac{1}{\sqrt{x}} = 3$, $x > 0$ हो तो $x^2(x^2 - 47) = ?$

[A] 0

[B] 2

[C] -1

[D] -2

46. If $x^2 - 15x + 1 = 0$, then what is the value of $x^4 - 223x^2 + 6$?

यदि $x^2 - 15x + 1 = 0$, तो $x^4 - 223x^2 + 6$ का मान क्या है?

[A] 9

[B] 5

[C] 6

[D] 0

47. If $x^2 - 9x + 1 = 0$, what is the value of $x^8 - 6239x^4 + 1$?

यदि $x^2 - 9x + 1 = 0$ है, तो $x^8 - 6239x^4 + 1$ का मान क्या होगा?

[A] 1

[B] 0

[C] -1

[D] 2

48. If $\left(3x + \frac{2}{x} - 4\right) = 10$, then what is the value of $\left(9x^2 + \frac{4}{x^2} + 24\right)$?

यदि $\left(3x + \frac{2}{x} - 4\right) = 10$, तो $\left(9x^2 + \frac{4}{x^2} + 24\right)$ का मान क्या है?

[A] 214

[B] 208

[C] 256

[D] 218

49. If $12x^2 - 21x + 1 = 0$, then what is the value of $9x^2 + (16x^2)^{-1}$?

यदि $12x^2 - 21x + 1 = 0$, तो $9x^2 + (16x^2)^{-1}$ का मान क्या है?

[A] $\frac{429}{8}$

[B] $\frac{465}{16}$

[C] $\frac{417}{16}$

[D] $\frac{453}{8}$

50. If $k - \frac{3}{k} = 5$, then what is the value of $k^2 + \frac{9}{k^2}$?

यदि $k - \frac{3}{k} = 5$, है, तो $k^2 + \frac{9}{k^2}$ का मान ज्ञात करें?

[A] 31

[B] 25

[C] 11

[D] 19