ALGEBRAIC FORMULAS

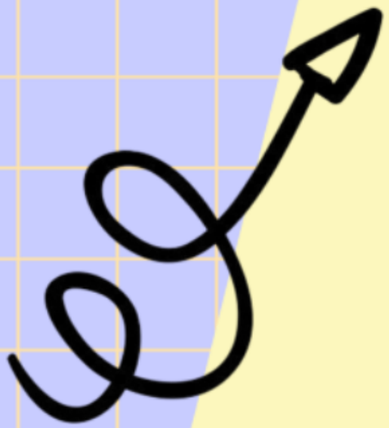
बीजगणितीय सूत्र

4 sheets Algebra + Quadratic equations

300+ Q's

≈20

I^st sheets



$$(a^m)^n = a^{m.n}$$

$$(x^2)^2 = x^4$$

$$(x^3)^4 = x^{3\times4} = x^{12}$$

If, $x^n = a \Rightarrow x = a^{\frac{1}{n}} = \sqrt[n]{a}$

$(x^n)^{\frac{1}{n}} = a^{\frac{1}{n}}$

तो, $x = a^{\frac{1}{n}}$

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

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

$a^m \longrightarrow a\times a\times a\times \ldots\ldots$ m बार

$$a^{\frac{1}{2}} = \sqrt{a}$$

$$a^{\frac{1}{3}} = \sqrt[3]{a}$$

$$a^{\frac{1}{5}} = \sqrt[5]{a}$$

If $x = \sqrt{16}$

तो $x = +4$

If, $x^2 = 16$

तो $x = \pm 4$

$(+4)^2 = (-4)^2 = 16$

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

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

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

Example $(2x + 7) \times (2x - 7) = ?$

$= (2x)^2 - 7^2$

$= 4x^2 - 49$

$a^2 - ab + ba - b^2$

$= a^2 - b^2$

$$(\sqrt{11}+\sqrt{3})\cdot(\sqrt{11}-\sqrt{3}) = \sqrt{11}^2 - \sqrt{3}^2 = 11-3 = 8$$

$$\frac{y^2-289}{y+17} = \frac{y^2-17^2}{y+17} = y-17$$

1. What is the product of (x+a) and (x+b)?

(x+a) और (x+b) का गुणनफल क्या है?

(RRB ALP 2024)

[A] $x^2 + (a-b)x + ab$ [B] $x^2 + (a+b)x - ab$

[C] $x^2 + (a-b)x - ab$ [D] $x^2 + (a+b)x + ab$

$(x+a)\cdot(x+b)$

$= x^2 + bx + ax + ab$

2. **The product of (x - 9) and (x + 8) is:**

(x - 9) और (x + 8) का गुणनफल _____ है।

[RRB Technician Grade 1 2024]

[A] $x^2 + x + 72$

[B] $x^2 - x - 72$

[C] $x^2 + 72$

[D] $x^2 + 2x - 72$

$(x-9) \times (x+8)$

$= x^2 - x - 72$

3. **Simplify: $(x + 5)(x - 5)$**

$x^2 - 5^2$ ← $(x + 5)(x - 5)$ को सरल कीजिए।

[A] $x^2 - 10x + 25$

[B] $x^2 - 25$

[C] $x^2 + 25$

[D] $x^2 + 10x + 25$

4. **Simplify the expression: $(7a + 4b)(7a - 4b)$**

व्यंजक $(7a + 4b)\cdot(7a - 4b)$ को सरल कीजिए।

[A] $49a^2 - 16b^2$

[B] $49a^2 + 16b^2$

[C] $21a^2 - 12b^2$

[D] $49a^2 - 8b^2$

$(7a)^2 - (4b)^2$

5. Simplify: $(x+2)^2 - (x-3)^2$.

$(x+2)^2 - (x-3)^2$ का मान ज्ञात करें।

[A] $2x + 5$

[B] $10x - 5$ ✓

[C] $10x + 5$

[D] $2x - 5$

$= (2x-1) \times 5$

6. Find the value of $(2x + 3)^2 - (2x - 3)^2 - 24x$.

$(2x + 3)^2 - (2x - 3)^2 - 24x$ का मान ज्ञात कीजिए।

[RRB Group D 2025]

[A] 2x

[B] 4x

[C] 0

[D] 1

$4x^2 \times 6 - 24x^2$

7. The value of $(x-y)(x+y)+(y-z)(y+z)+(z-x)(z+x)$ is?

$(x-y)(x+y)+(y-z)(y+z)+(z-x)(z+x)$ का मान क्या है?

(RRB ALP 2024)

[A] $x^2+y^2+z^2$

[B] $x+y+z$

[C] 0

[D] xy+yz+zx

$x^2-y^2+y^2-z^2+z^2-x^2$

$=0$

8. Simiplify/सरल कीजिए।

$$\frac{36a^2-49b^2}{6a+7b}.$$

[A] 6a – 7b

[B] $\frac{1}{6a-7b}$

[C] 6a + 7b

[D] 7b – 6a

$$\frac{(6a)^2-(7b)^2}{(6a)+(7b)} = 6a-7b$$

9. If $m^2 - n^2 = 63$ and $m - n = 7$, find the value of $m + n$.

यदि $m^2 - n^2 = 63$ and $m - n = 7$, है, तो $m + n$ का मान ज्ञात कीजिए।

SSC CHSL PRE 2022

[A] 7

[B] 9

[C] 24

[D] 18

$a-(-a)=2a$

10. Simplify the given expression.

दिए गए व्यंजक को सरल करें।

$(x^2+xy+y^2)^2-(x^2-xy+y^2)^2$

[RRB Group D-2022]

[A] $4xy(x^2+y^2)$

[B] $2xy(x^2-y^2)$

[C] $4xy(x^2-y^2)$

[D] $2xy(x^2+y^2)$

$= 2(x^2+y^2) \times 2xy$

11. Simplify: $(x^2 + m^2 - z^2)^2 - (x^2 - m^2 + z^2)^2$:

सरल कीजिए: $(x^2 + m^2 - z^2)^2 - (x^2 - m^2 + z^2)^2$:

[RRB Group D-2022]

[A] $4x(m^2 - z^2)$

[B] $4x^2(m^2 - z^2)$

[C] $3x^2(m^2 - z^2)$

[D] $2x^2(m^2 - z^2)$

$= 2x^2 \times (2m^2 - 2z^2)$

12. Simplify $(3x - 2y)(3x + 2y)(9x^2 + 4y^2)$:

$(3x-2y)(3x+2y)(9x^2+4y^2)$ को सरल कीजिए।

[SSC CHSL 2023]

[A] $81x^4 - 16y^4$

[B] $81y^4 + 16x^4$

[C] $81y^4 + 16x^4$

[D] $81y^4 - 16x^4$

$(9x^2 - 4y^2) \times (9x^2 + 4y^2)$

$= (9x^2)^2 - (4y^2)^2$

13. $(x-y)(x+y)(x^2+y^2)(x^4+y^4)$ is equal to:

$(x-y)(x+y)(x^2+y^2)(x^4+y^4)$ निम्नलिखित में से किसके बराबर है?

(RRB TECHNICIAN GRADE-3, 2024)

[A] $x^{16}-y^{16}$

[B] x^8-y^8

[C] $x^{16}+y^{16}$

[D] x^8+y^8

$(x^2-y^2)\cdot(x^2+y^2)(x^4+y^4)$

$\downarrow$

$(x^4-y^4)\cdot(x^4+y^4)$

$\downarrow$

x^8-y^8

14. **Find the value of the following expression.**

निम्नलिखित व्यंजक का मान ज्ञात कीजिए।

$$(1+x)(1+x^2)(1+x^4)(1+x^8)(1-x)$$

[RRB NTPC - 2021]

[A] $(1-x)^2$

[B] $(1-x^{16})$

[C] $(1+x^{16})$

[D] $(1-x^8)$

$1-x^2$

15. $\left(x+\frac{1}{x}\right)\left(x-\frac{1}{x}\right)\left(x^2+\frac{1}{x^2}\right)\left(x^4+\frac{1}{x^4}\right)$ is equal to:

$\left(x+\frac{1}{x}\right)\left(x-\frac{1}{x}\right)\left(x^2+\frac{1}{x^2}\right)\left(x^4+\frac{1}{x^4}\right)$ निम्नलिखित में से किसके बराबर है?

(RRB TECHNICIAN GRADE-3 2024)

[A] $x^8-\frac{1}{x^8}$

[B] $x^4-\frac{1}{x^4}$

[C] $x^{10}-\frac{1}{x^{10}}$

[D] $x^6-\frac{1}{x^6}$

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

16. What is the value of/का मान क्या है?

$$\frac{\left(k+\frac{1}{k}\right)\left(k-\frac{1}{k}\right)\left(k^2+\frac{1}{k^2}\right)\left(k^4+\frac{1}{k^4}\right)\left(k^8+\frac{1}{k^8}\right)\left(k^{16}+\frac{1}{k^{16}}\right)\left(k^{32}+\frac{1}{k^{32}}\right)}{\left(k+\frac{1}{k}\right)}?$$

SSC CHSL TIER – I 2022

[A] $\frac{k^{64}-\frac{1}{k^{64}}}{k+\frac{1}{k}}$

[B] $\frac{k^{32}-\frac{1}{k^{32}}}{k-\frac{1}{k}}$

[C] $\frac{k^{32}-\frac{1}{k^{32}}}{k+\frac{1}{k}}$

[D] $\frac{k^{32}+\frac{1}{k^{64}}}{k+\frac{1}{k}}$

$$\frac{k^{64}-\frac{1}{k^{64}}}{k+\frac{1}{k}}$$

17. $(x + y + 2z)(x + y)$ can be expressed in which of the following form?

$(x + y + 2z)(x + y)$ को निम्नलिखित में से किस रूप में व्यक्त किया जा सकता है?

[RRB Group D-2022]

[A] $(x + y + z)^2 - y^2$ ✗

[B] $(x + y + z)^2 - z^2 = (x+y+2z)\cdot(x+y)$

[C] $(x + y + z)^2 - x^2$

[D] $(x - y + z)^2 - z^2$