

$$\textcircled{1} x + \frac{1}{x} = 1$$

$$\boxed{x^3 = -1}$$

$$x + \frac{1}{x} = 1$$

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

$$x^2 + 1 = x$$

$$\boxed{x^2 - x + 1 = 0}$$

$$x^3 + 1^3 = (x+1)(\underline{x^2 - x + 1})$$

$$x^3 + 1^3 = (x-1) \times 0 = 0$$

$$x^3 + 1 = 0$$

$$\boxed{x^3 = -1}$$

$$x + \frac{1}{x} = -1$$

$$\boxed{x^3 = 1}$$

$$\textcircled{i} x + \frac{1}{x} = 1$$

$$\boxed{x^3 = -1}$$

$$\textcircled{ii} x + \frac{1}{x} = -1$$

$$\boxed{x^3 = 1}$$

$$\# x + \frac{1}{x} = 1$$

$$(x^3 = -1)$$

यदि power का उत्तर (3) हो तो
जोड़ का मान 0 होगा।

$$\textcircled{1} x + \frac{1}{x} = 1$$

$$\underbrace{x^{12} + x^{15}}_0 + \underbrace{x^{19} + x^{22}}_0 + \underbrace{x^{129} + x^{132}}_0 + 8$$

$$0 + 8 = \underline{8 \text{ Ans.}}$$

$$(x^3 = -1)$$

$$\textcircled{2} x + \frac{1}{x} = 1$$

$$\overbrace{x^{522} + x^{527} + x^{629} + x^{530} + x^{525} + x^{632} + x^{18}}_0 + 10$$

$$\begin{aligned} x^{18} + 10 &= (x^3)^6 + 10 \\ &= (-1)^6 + 10 = 1 + 10 = \underline{11 \text{ Ans.}} \end{aligned}$$

$$\# x + \frac{1}{x} = \sqrt{3}$$

$$(x^6 = -1)$$

$$\# x + \frac{1}{x} = -\sqrt{3}$$

$$(x^6 = -1)$$

$$x + \frac{1}{x} = \pm \sqrt{3}$$

$$(x^6 = -1)$$

अदि power का अंतर 6 हो तो
जोड़न मान 0 होगा।

$$\# \quad x + \frac{1}{x} = \sqrt{3} \quad (x^6 = -1)$$

$$x^{12} + x^{18} + x^{23} + x^{29} + \boxed{x^{54} + 15}$$

$$x^{54} + 15$$

$$(x^6)^9 + 15$$

$$(-1)^9 + 15$$

$$-1 + 15 = 14 \text{ Ans.}$$

11. If $a + \frac{1}{a} = \sqrt{3}$, then find the value of $(a^{18} + a^{12} + a^6 + 1)$.

यदि $a + \frac{1}{a} = \sqrt{3}$ हो, तो $(a^{18} + a^{12} + a^6 + 1)$ का मान बतायें।

- ~~(A)~~ 0 (B) 1 (C) -1 (D) 4

$$a + \frac{1}{a} = \sqrt{3}$$

$$(a^6 = -1)$$

power का अंतर 6 जोड़
का मान 0 होगा।

$$a^6 + 1$$

$$-1 + 1 = 0$$

12. If $x + \frac{1}{x} = 3$, then find the value of $x^5 + \frac{1}{x^5}$.

यदि $x + \frac{1}{x} = 3$, तो $x^5 + \frac{1}{x^5}$ का मान बतायें।

- (A) 113 (B) 129 (C) 126 (D) 123

$$\textcircled{1} x^5 + \frac{1}{x^5} = \left(x^2 + \frac{1}{x^2}\right) \left(x^3 + \frac{1}{x^3}\right) - \left(x + \frac{1}{x}\right)$$

$$\textcircled{II} x^7 + \frac{1}{x^7} = \left(x^3 + \frac{1}{x^3}\right) \left(x^4 + \frac{1}{x^4}\right) - \left(x + \frac{1}{x}\right)$$

$$x^5 + \frac{1}{x^5} = \left(x^2 + \frac{1}{x^2}\right) \left(x^3 + \frac{1}{x^3}\right) - \left(x + \frac{1}{x}\right)$$

$$= 7 \times 18 - 3$$

$$= 126 - 3$$

$$= 123 \underline{\text{Ans.}}$$

$$x + \frac{1}{x} = 3$$

$$\textcircled{1} x^2 + \frac{1}{x^2} = 3^2 - 2 = \textcircled{7}$$

$$\textcircled{II} x^3 + \frac{1}{x^3} = 3^3 - 3 \times 3 = \textcircled{18}$$

$$\textcircled{\text{iii}} \quad x^5 - \frac{1}{x^5} = (x^2 + \frac{1}{x^2})(x^3 - \frac{1}{x^3}) - (x - \frac{1}{x})$$

$$= x^5 - \cancel{\frac{1}{x}} + \cancel{x} - \frac{1}{x^5} - \cancel{x} + \cancel{\frac{1}{x}}$$

$$= x^5 - \frac{1}{x^5}$$

$$\# \quad x^5 - \frac{1}{x^5} = (x^2 + \frac{1}{x^2})(x^3 - \frac{1}{x^3}) - (x - \frac{1}{x})$$

$$\# \quad x^7 - \frac{1}{x^7} = (x^3 - \frac{1}{x^3})(x^4 + \frac{1}{x^4}) + (x - \frac{1}{x})$$

$$\textcircled{\text{iv}} \quad x^7 - \frac{1}{x^7} = (x^3 - \frac{1}{x^3})(x^4 + \frac{1}{x^4}) + (x - \frac{1}{x})$$

$$= x^7 + \cancel{\frac{1}{x}} - \cancel{x} - \frac{1}{x^7} + \cancel{x} - \cancel{\frac{1}{x}}$$

$$= x^7 - \frac{1}{x^7}$$

$$\# \quad x - \frac{1}{x} = 3$$

$$x^5 - \frac{1}{x^5} = \left(x^2 + \frac{1}{x^2}\right) \left(x^3 - \frac{1}{x^3}\right) - \left(x - \frac{1}{x}\right)$$

11 x 36 - 3

$$396 - 3$$

$$= 393 \underline{\text{Ans.}}$$

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

$$\textcircled{i} \quad x^2 + \frac{1}{x^2} = 3^2 + 2$$

$x^2 = 11$

$$\textcircled{ii} \quad x^3 - \frac{1}{x^3} = 3^3 + 3 \times 3$$

$= 27 + 9$
 $= 36$

concept

$$x = \frac{p+q}{p-q}$$

$$y = \frac{p-q}{p+q}$$

$$\textcircled{i} \ x+y = \frac{2(p^2+q^2)}{p^2-q^2}$$

$$\textcircled{ii} \ x-y = \frac{4pq}{p^2-q^2}$$

$$\textcircled{iii} \ x \times y = 1$$

13. If $x = \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ and $y = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$, then find the value of

$$\frac{x^2 + xy + y^2}{x^2 - xy + y^2} = ?$$

Handwritten note: $x+y = \frac{2(5+3)}{5-3} = \frac{16}{2} = 8$

यदि $x = \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ और $y = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$, हो, तो

$$\frac{x^2 + xy + y^2}{x^2 - xy + y^2} = ?$$

Handwritten note: $xy = 1$

- (A) $\frac{63}{61}$ (B) $\frac{65}{63}$ (C) $\frac{69}{67}$ (D) $\frac{67}{65}$

$$\frac{x^2 + xy + y^2}{x^2 - xy + y^2} = \frac{x^2 + xy + xy + y^2 - xy}{x^2 - xy + 3xy + y^2 - 3xy}$$

$$= \frac{(x^2 + 2xy + y^2) - xy}{(x^2 + 2xy + y^2) - 3xy}$$

$$= \frac{(x+y)^2 - xy}{(x+y)^2 - 3xy}$$

$$= \frac{8^2 - 1}{8^2 - 3 \times 1} = \frac{64 - 1}{64 - 3} = \frac{63}{61}$$

14. If $(2, 0)$ is a solution of the linear equation $2x + 3y = K$, then the value of K is:—

यदि रैखिक समीकरण $2x + 3y = K$ का हल $(2, 0)$ है, तो K का मान बताइये।

- (A) 6 ~~(B) 4~~ (C) 5 (D) 2

$$2x + 3y = K$$

$$2 \times 2 + 3 \times 0 = K$$

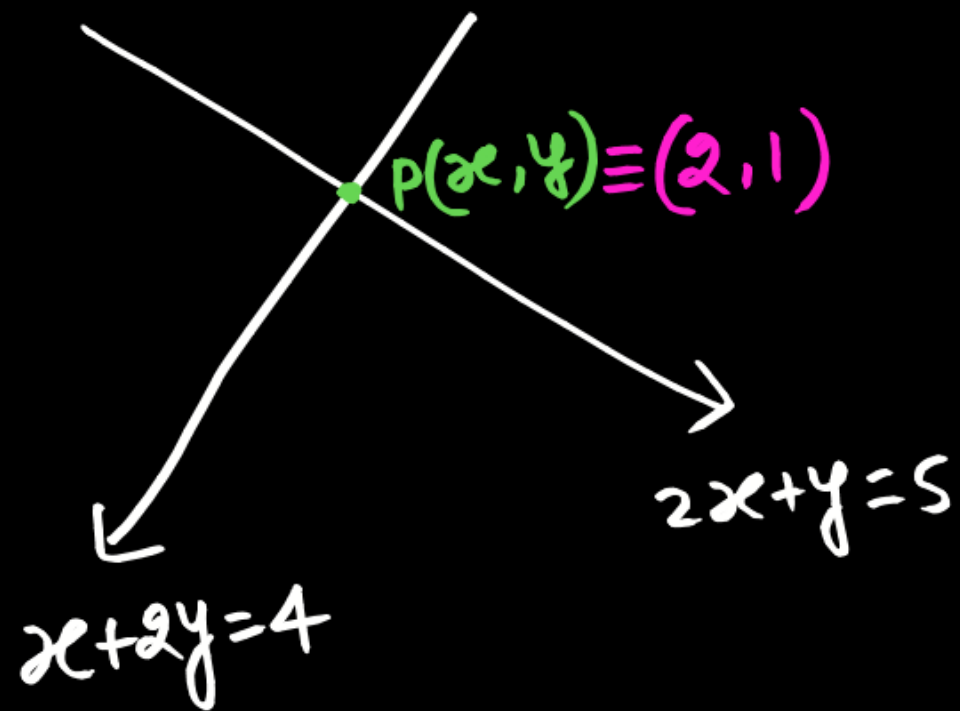
$$4 + 0 = K$$

$$(K = 4)$$

15. The lines $2x + y = 5$ and $x + 2y = 4$ intersect at the point.

$2x + y = 5$ और $x + 2y = 4$, दो रेखाएँ एक-दूसरे को किस बिन्दु पर काटेगी ?

- ✓ (A) $(2, 1)$ (B) $(1, 2)$ (C) $\left(\frac{5}{2}, 0\right)$ (D) $(0, 2)$





$$\begin{array}{r}
 (2x + y = 5) \times 2 \\
 x + 2y = 4 \\
 \hline
 3x = 6 \\
 \boxed{x = 2} \\
 2 \times 2 + y = 5 \\
 y = 5 - 4 = 1 \\
 \textcircled{y = 1}
 \end{array}$$



concept

$$a_1x + b_1y + c_1 = 0$$

$$a_2x + b_2y + c_2 = 0$$

① $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \rightarrow$ केवल एक ही  प्रतिच्छेदित रेखा

② $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2} \rightarrow$ कोई हल नहीं  समांतर रेखा

③ $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \rightarrow$ अनंत हल   सम्पाती रेखा

16. For what value of K, the system of equations $3x + y - 1 = 0$ and $Kx + 2y - 5 = 0$ has a unique solution ?

K के किस मान के लिये, समीकरण $3x + y - 1 = 0$ और $Kx + 2y - 5 = 0$ का अद्वितीय हल है ?

(A) $K = 1$

(B) $K = 3$

(C) $K = 2$

~~(D)~~ All of these

$$3x + y - 1 = 0$$

$$Kx + 2y - 5 = 0$$

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \text{ के लिए एक हल}$$

$$\frac{3}{K} \neq \frac{1}{2}$$

$$K \neq 6$$

17. For what value of K, the system of equations $Kx - 20y = 16$ and $6x - 10y = 14$ has no solutions ?

K के किस मान के लिये समीकरण $Kx - 20y = 16$ और $6x - 10y = 14$ का कोई हल नहीं है ?

- (A) 7 (B) 10 ~~(C) 12~~ (D) 6

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \text{ कोई हल नहीं}$$

$$\frac{K}{6} = \frac{-20}{-10}$$

$$K = 12$$

18. Find the minimum value of $4x^2 + 2x + 1$.

$4x^2 + 2x + 1$ का न्यूनतम मान ज्ञात करें।

(A) $\frac{3}{4}$

(B) $\frac{4}{3}$

(C) $-\frac{3}{4}$

(D) $-\frac{4}{3}$

H.W/R.W

$$\text{max}^m / \text{min}^m = \frac{4ab - b^2}{4a}$$