

3 eqⁿ, 3 variables

≠



$$3x(3x + 8y = 24)$$

$$4x(7x - 6y = 11)$$

तो $x =$
 $y =$

$$9x + 24y = 72$$

$$\text{and } 28x - 24y = 11$$

$$37x = 83$$

$$x = \frac{83}{37}$$



102. Solve the following system of linear equations:
निम्नलिखित रैखिक समीकरणों के निकाय का हल कीजिए।
(RRB NTPC GRADUATE LEVEL CBT-1 2026)

✓ $u + v + w = 2$

$6u + 4v + 5w = 31$

$18 - 72 + 85$

✓ $5u + 2v + 2w = 13$

~~[A]~~ $u = 1, v = 15, w = -14$

~~[B]~~ $u = 3, v = -15, w = 14$

~~[C]~~ $u = 1, v = 18, w = -17$

✓ ~~[D]~~ $u = 3, v = -18, w = 17$

#

$5 + 30 - 28$

$15 - 30 + 28$

$5 + 36 - 34$

$15 - 36 + 34$



103. Solve the following system of linear equations:
निम्नलिखित रैखिक समीकरणों के निकाय को हल कीजिए।
(RRB NTPC GRADUATE LEVEL CBT-1 2025)

$$\begin{cases} -p + 2q - 3r = -9 \\ p - 3q + r = 6 \end{cases}$$

$$2p - 5q + 5r = 17$$

[A] $p = -1, q = 3, r = 2$ ✗

[B] $p = 1, q = -1, r = 2$ ✓

[C] $p = 1, q = 1, r = -2$ ✗

[D] $p = -1, q = -1, r = 3$ ✗

$$-9 - 2r = -3$$

$$9 + 2r = 3$$

$$-1 + 6$$

104. Solve the given equations for (x, y, z):

दिए गए समीकरणों को (x, y, z) के लिए हल कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

$$x + y + z = 2$$

$$6x - 4y + 5z = 31$$

$$5x + 2y + 2z = 13$$

[A] (3, -2, -1) ✗

[B] (-3, -2, 1) ✗

✓ [C] (3, -2, 1)

[D] (3, 2, 1) ✗

x y z

105. Find the solution of the following system of linear equations:

निम्नलिखित रैखिक समीकरणों के निकाय का हल ज्ञात कीजिए।

[RRB GROUP – D 2025]

$$x + 4y + 2z = 12$$

$$2x - y + z = 3$$

$$3x = 3$$

$$x = 1$$

$$1 + \frac{3}{2} - \frac{5}{2} = 0 \checkmark$$

$$x + y - z = 0$$

[A] ~~$x = \frac{5}{2}, y = 1, z = \frac{3}{2}$~~

[B] ~~$x = 1, y = \frac{5}{2}, z = \frac{3}{2}$~~

☒ [C] $x = 1, y = \frac{3}{2}, z = \frac{5}{2}$

[D] ~~$x = \frac{3}{2}, y = 1, z = \frac{5}{2}$~~

106. Solve the following system of 3 equations in 3 unknowns.

3 अज्ञातों वाले निम्नलिखित 3 समीकरणों के निकाय हल कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

$$x - 3z = -5$$

$$2x - y + 2z = 16$$

$$7x - 3y - 5z = 19$$

$$[A] \ x = 4, y = -2, z = -3$$

$$[B] \ x = 4, y = -2, z = 3$$

$$[C] \ x = -4, y = 2, z = -3$$

$$[D] \ x = -4, y = 3, z = -2$$

$$-4 + 9$$

$$-4 + 16 = 2$$

107. What is the solution to the following system of linear equations?

निम्नलिखित रैखिक समीकरण निकाय का हल क्या होगा?

(SSC SELECTION POST XI 2023)

$$3x - 9y + 4z = 5$$

$$2x + 7y + z = 12$$

$$3x - z = 0$$

[A] $x = \frac{143}{150}, y = \frac{31}{37}, z = \frac{143}{50}$

[B] $x = \frac{143}{150}, y = \frac{31}{30}, z = \frac{143}{50}$

[C] $x = \frac{137}{150}, y = \frac{31}{30}, z = \frac{143}{50}$

[D] $x = \frac{143}{150}, y = \frac{31}{30}, z = \frac{143}{51}$

$3x = z$

$8x/143$

108. Find the solution of the following system of linear equations:

निम्नलिखित रैखिक समीकरणों के निकाय का हल ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2026)

$$2x + y + z = 25$$

$$x - 3y + 2z = 0$$

$$y - z = 6$$

[A] $x = \frac{55}{4}, y = \frac{-17}{4}, z = \frac{7}{4}$ ✗

[B] $x = \frac{-17}{4}, y = \frac{55}{4}, z = \frac{7}{4}$ ✗

[C] $x = \frac{7}{4}, y = \frac{55}{4}, z = \frac{-17}{4}$ ✗

[D] $x = \frac{55}{4}, y = \frac{7}{4}, z = \frac{-17}{4}$ ✓

$y - z = \frac{21}{4}$

109. Solve the following system of equations:
निम्नलिखित समीकरणों के निकाय को सरल कीजिए।
(RRB NTPC GRADUATE LEVEL CBT-1 2026)

$$x + 2y + 4z = 14$$

$$\begin{cases} x + 4y + 2z = 7 \\ 2x + y + 2z = 2 \end{cases}$$

- [A] $x = -\frac{10}{3}, y = 3, z = \frac{7}{3}$
- [B] $x = -\frac{11}{3}, y = 3, z = \frac{7}{3}$
- [C] $x = -\frac{10}{3}, y = 4, z = \frac{8}{3}$
- [D] $x = -\frac{10}{3}, y = 4, z = \frac{7}{3}$

$$3z = 7$$

$$z = \frac{7}{3}$$

$$3y = 12$$

$$y = 4$$

110. The solution of the system of the given linear equations is:

निम्न रैखिक समीकरणों के निकाय का हल क्या होगा?

$$2x + 3y - z = 5$$

$$x - 2y + 4z = -2$$

$$3x + y + 2z = 7$$

[RRB JE 2024]

$$\frac{44}{7} + \frac{54}{7} - 16 = -2$$

[A] $x = \frac{-44}{7}, y = \frac{27}{7}, z = -4$ ✗

[B] $x = \frac{-44}{7}, y = \frac{-27}{7}, z = 4$ ✗

✓ [C] $x = \frac{44}{7}, y = \frac{-27}{7}, z = -4$

[D] $x = \frac{44}{7}, y = \frac{-27}{7}, z = -8$ ✗

$$\begin{cases} 3x + y + 3z = 3 \\ 3x + y + 2z = 7 \end{cases}$$

$$z = -4$$

111. Find the value of x, y and z from the following equations:

निम्नलिखित समीकरणों से x, y और z का मान ज्ञात कीजिए।

$$3x + 2y - z = 24, \quad x - 5y + 3z = 16, \quad x + y - 3z = 21$$

(RRB JE 2025)

[A] $x = \frac{-229}{42}, y = \frac{-289}{42}, z = \frac{97}{21}$

[B] $x = \frac{389}{42}, y = \frac{-97}{21}, z = \frac{-229}{42}$

[C] $x = \frac{289}{42}, y = \frac{97}{21}, z = \frac{229}{42}$

[D] $x = \frac{-97}{21}, y = \frac{-289}{42}, z = \frac{229}{42}$

111=3X37

$$x - 5y + 3z = 16$$

$$x + y - 3z = 21$$

$$2x - 4y = 37$$

$$\frac{389}{21} + \frac{4 \times 97}{21} = \frac{777}{21} = 37$$

112. How many solutions for given three unknowns are possible to satisfy all these equations?

दिए गए तीन अज्ञातों के लिए कितने हल संभव हैं जो इन सभी समीकरणों को संतुष्ट करते हैं?

$$\text{add } \begin{cases} -3\alpha + 2\beta + -5\gamma = -14 \\ 2\alpha - 3\beta + 4\gamma = 10 \\ \alpha + \beta + \gamma = 4 \end{cases}$$

α, β, γ

(RRB NTPC GRADUATE LEVEL CBT-1 2026)

- [A] Unique solution/अद्वितीय समाधान
- [B] Infinite solutions/अनंत समाधान
- [C] No solution/कोई समाधान नहीं
- [D] Two solutions/दो विकल्प

$$-\alpha - \beta - \gamma = -4$$

$$\alpha + \beta + \gamma = 4$$

$$2x + 3y = 10$$

2510

$$\frac{10}{2} \frac{3}{8} 0 2$$

စာမေးပွဲ

$$x, y, z$$


113. If $x = \alpha$ & $y = \beta$ satisfy the equations $5x + 9y = 37xy$ and $4x - 7y = -13xy$, $x \neq 0, y \neq 0$, then what is the value of $\alpha^{-2} + \beta^{-2} - (\alpha\beta)^{-1}$?

यदि $x = \alpha$ और $y = \beta$ समीकरणों $5x + 9y = 37xy$ और $4x - 7y = -13xy$, $x \neq 0, y \neq 0$ को संतुष्ट करें, तो $\alpha^{-2} + \beta^{-2} - (\alpha\beta)^{-1}$ का मान क्या है?

(ICAR Assistant 2022)

[A] 5

[C] 9

[B] 7

[D] 11

$$\frac{1}{\alpha^2} + \frac{1}{\beta^2} - \frac{1}{\alpha\beta}$$

$$9 + 4 - 6$$

$$= 7$$

$$\frac{1}{\alpha} = 2$$

$$\frac{1}{\beta} = 3$$

$$7x \left(\frac{5}{y} + \frac{9}{x} = 37 \right)$$

$$9x \left(\frac{4}{y} - \frac{7}{x} = -13 \right)$$

$$\frac{71}{y} = 259 - 117$$

$$\frac{71}{y} = 142$$

$$\left(\frac{5}{y} \right) + \frac{9}{x} = 37$$

$$10 + \frac{9}{x} = 37$$

$$\frac{9}{x} = 27$$

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

Algebra का Remainder Theorem Based Concept:-

$$f(x) = ax^3 + bx^2 + cx + d$$

↓
Polynomial
(बहुपद)

$$\frac{f(x)}{x-a} = \text{rem. } f(a)$$

but $x-a=0$
 $\Rightarrow x=a$

Handwritten example: $8 \overline{) 50} \text{ Rem } 2$

$$50 = 8 \times 6 + 2$$

अगर किसी Polynomial (बहुपद) को $(x-a)$ से भाग देते है तो Remainder (r) आता है

$$x-a) \boxed{f(x)} (Q \text{ भागफल}$$

$$\underline{\hspace{1cm}}$$

$$(r) \text{ Rem}$$

$$f(x) = (x-a)Q + r$$

but $x-a=0$
 $\Rightarrow x=a$

$$f(a) = r$$



114. What is the remainder when (x^2-4x+7) is divided by $(x-2)$?

$f(x) = (x^2-4x+7)$ को $(x-2)$ से भाग देने पर शेषफल क्या प्राप्त होता है?

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] 3 ✓

[B] -1

[C] 1

[D] 7

$$\text{Rem} = 2^2 - 4 \times 2 + 7 = 3$$

$$\text{Let } x-2=0$$

$$x=2$$

115. Find the remainder on dividing $(5x^3 + 4x^2 - 10x + 1)$ by $(2x - 4)$.

$(5x^3 + 4x^2 - 10x + 1)$ को $(2x - 4)$ से भाग देने पर शेषफल ज्ञात कीजिए।

SSC CHSL PRE 2025

[A] 45

[B] 37

[C] 11

[D] 78

$$\text{put } 2x - 4 = 0$$

$$x = 2$$

$$\text{Rem} = 40 + 16 - 20 + 1 = 37$$

116. When $f(m) = m^5 + 5m^4 - 3m + 7$ is divided by $(m-2)$, then the remainder is ____?
जब $f(m) = m^5 + 5m^4 - 3m + 7$ को $(m-2)$ से विभाजित किया जाता है, तो शेषफल ____ होता है?

SSC CGL Pre 2024

[A] 78

[B] 95

[C] 110

☒ [D] 113

117. The remainder when $3x^3 - 2x^2y - 13xy^2 + 10y^3$ is divided by $(x - 2y)$ is equal to

$3x^3 - 2x^2y - 13xy^2 + 10y^3$ को $(x - 2y)$ से विभाजित करने पर शेषफल है

[A] 0

[B] y

[C] $y - 5$

[D] $y + 3$

put $x - 2y = 0$

$x = 2y$

Rem = ~~$24y^3 - 8y^3 - 26y^3 + 10y^3$~~
 $= 0$

$$\frac{36}{9} = 0 \text{ Rem}$$

$$\textcircled{9} \overline{) 36} \begin{matrix} 4 \\ \underline{36} \\ 0 \end{matrix} = \text{Rem}$$

9, 36 का सस factor है।



118. If dividing $2x^m + x^3 - 3x^2 - 26$ by $x - 2$ leaves remainder 994, then find the value of 'm'.
 यदि $2x^m + x^3 - 3x^2 - 26$ को $x-2$ से विभाजित करने पर शेष 994 बचता है, तो 'm' का मान ज्ञात कीजिए।

RRB RPF Constable – 20/01/2019 (Shift-II)

[A] 10

[B] 9

[C] 11

[D] 8

put $x-2=0$
 $x=2$

Rem.

$$2 \times 2^m + 8 - 12 - 26 = 994$$

$$2 \times 2^m = 1024$$

$$2^m = 2^9$$

$$\Rightarrow m = 9$$

119. If the polynomial $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 7x + a$ leaves the same remainder, when divided by $(x - 2)$, then find the value of a .

यदि बहुपद $ax^3 + 4x^2 + 3x - 4$ और $x^3 - 7x + a$ को $(x - 2)$ से विभाजित करने पर समान शेषफल प्राप्त होता है, तो a का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL 2025 CBT-1)

[A] $\frac{-17}{5}$
[C] $\frac{-36}{5}$

[B] $\frac{-24}{7}$
[D] $\frac{-21}{8}$

put $x-2=0$
 $x=2$

same Rem

$$8a + 16 + 2 = 8 - 14 + a$$

$$7a = -6 - 18$$

$$a = \frac{-24}{7}$$

120. What must be added to $(x^3 - 3x^2 + 4x - 75)$ to obtain a polynomial that is exactly divisible by $(x - 5)$?

एक बहुपद प्राप्त करने के लिए $(x^3 - 3x^2 + 4x - 75)$ में क्या जोड़ा जाना चाहिए जो $(x - 5)$ से बिल्कुल विभाज्य है?

SSC CPO 2024

[A] 5

[C] 4

[B] 6

[D] 2

$$\text{put } x - 5 = 0$$

$$x = 5$$

$$Rem = 125 - 75 + 20 - 75 = -5 + 5 = 0$$

121. If $(x + 3)$ is a factor of $x^3 + 3x^2 + 4x + k$, then what is the value of k ?

यदि $(x + 3)$, $x^3 + 3x^2 + 4x + k$ का एक गुणनखंड है, तो k का मान क्या है?

[A] 12

[B] 24

[C] 36

[D] 72

put $x+3=0$
 $x=-3$

का factor

$$\cancel{-27} + \cancel{27} - 12 + k = 0$$

$$k = 12$$

Rem

122. If $x^3 - 6x^2 + ax + b$ is divisible by $(x^2 - 3x + 2)$, then the values of a and b are:

यदि $x^3 - 6x^2 + ax + b$, $(x^2 - 3x + 2)$ से विभाज्य है, तो a और b के मान हैं:

(SSC CHSL 2020)

[A] ~~$a = -11$~~ and $b = 6$

[B] ~~$a = -6$~~ and $b = -11$

☒ [C] $a = 11$ and $b = -6$

[D] ~~$a = 6$~~ and $b = 11$

का factor

$$x^2 - 3x + 2 \checkmark$$

$$= x^2 - 3x + 2$$

$$= x(x-2) - 1(x-2)$$

$$= (x-2)(x-1) \checkmark \checkmark$$

$$\text{but } x-2=0 \Rightarrow x=2$$

$$\text{but } x-1=0 \Rightarrow x=1$$

$$\text{Rem} = 0$$

$$8 - 24 + 11a + b = 0$$

$$\{11a + b = 16\}$$

$$\begin{array}{r} 36 \\ 12 \\ \hline 4 \quad 3 \end{array} \quad \text{Rem} = 0$$


$$\text{HCF}(15, 20) = 5$$

$$\text{LCM}(15, 20) = 60$$



123. What is the HCF of $(x^6 + 1)$ and $(x^4 - 1)$?

$(x^6 + 1)$ और $(x^4 - 1)$ का महत्तम समापवर्तक (HCF) क्या है?

(SSC CPO 2023)

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

[B] $(1+x)$

[C] 1

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

$$(x^2)^3 + 1^3$$

$$(x^2)^3 - 1^3$$

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

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

124. What is the HCF of the polynomials $(x^4 - 1)$, $(x^3 - 3x^2 + 3x - 1)$, $(x^4 - 3x + 2)$ and $(x^3 - 2x^2 + x)$?

बहुपदों $(x^4 - 1)$, $(x^3 - 3x^2 + 3x - 1)$ और $(x^3 - 2x^2 + x)$ का महत्तम समापवर्तक क्या होगा?

(DELHI POLICE 2022)

[A] $(x-4)$

[B] $(x-2)$

[C] $(x-7)$

[D] $(x-1)$

125. Find the HCF of $(x^2 + 3x - 4)$ and $(x^2 + 5x + 4)$.

$(x^2 + 3x - 4)$ और $(x^2 + 5x + 4)$ का HCF ज्ञात कीजिए।

[A] ~~$x - 4$~~

[C] ~~$x + 5$~~

[B] $x + 4$

[D] ~~$x - 1$~~

$(x+1) \cdot (x+4)$

126. What is the HCF of the polynomials $x^6 - 3x^4 + 3x^2 - 1$ and $x^3 + 3x^2 + 3x + 1$?

बहुपदों $(x^3)^3 - 3x^4 + 3x^2 - 1$ और $x^3 + 3x^2 + 3x + 1$ का HCF क्या है?

[A] $(x+1)$

[B] $(x+1)^2$

[C] $x^2 + 1$

[D] $(x+1)^3$

$$(x^3 - 1)^3 = (x-1)^3 (x^2 + x + 1)^3$$

$$(x+1)^3$$

127. LCM of $x^2 - 8x + 15$ & $x^2 - 5x + 6$ is?

$x^2 - 8x + 15$ & $x^2 - 5x + 6$ का LCM ----- है?)

(SSC MAINS 2022) (SSC CPO 2023)

[A] $(x+6)(x+1)(x-3)$ [B] $(x-2)(x-3)(x-5)$

[C] $(x-6)^2(x+1)(x-3)$ [D] $(x-6)(x+1)(x-3)$

$$(x-5) \cdot (x-3)$$

$$(x-2) \cdot (x-3)$$

128. The LCM of $x^3 - 27, x^2 - x - 6, x + 2$ is?

$x^3 - 27, x^2 - x - 6, x + 2$ का LCM है?

$x^3 - 27$
(SSC MTS 2024)

[A] $(x - 3)(x + 2)(x^2 - 3x + 9)$

[B] $(x + 3)(x + 2)(x^2 - 3x + 9)$

[C] $(x - 3)(x + 2)(x^2 + 3x - 9)$

[D] $(x - 3)(x + 2)(x^2 + 3x + 9)$

$(x - 3) \cdot (x^2 + 3x + 9)$

129. What is the LCM of $x^3 + 8$, $x^2 + 5x + 6$ and $x^3 + 4x^2 + 4x$?

$x^3 + 8$, $x^2 + 5x + 6$ और $x^3 + 4x^2 + 4x$ का LCM क्या है?

[A] $x(x + 2)^2(x + 3)(x^2 - 2x + 4)$

[B] $x(x - 2)^2(x - 3)(x^2 + 2x + 4)$

[C] $x(x + 2)^2(x - 3)(x^2 - 2x + 4)$

[D] $x(x + 2)^2(x - 3)(x^2 - 2x + 4)$

130. If $(x + k)$ is the HCF of $x^2 + 5x + 6$ and $x^2 + 8x + 15$, then what is the value of k ?

यदि $(x + k)$, $x^2 + 5x + 6$ और $x^2 + 8x + 15$ का HCF है, तो k का मान क्या है?

[A] 5

[C] 2

[B] 3

[D] 1

$(x+2) \cdot (x+3)$

$(x+5) \cdot (x+3)$

131. The HCF and the LCM of two polynomials are $3x + 1$ and $30x^3 + 7x^2 - 10x - 3$ respectively. If one polynomial is $6x^2 + 5x + 1$, then what is the other polynomial?

दो बहुपदों के HCF और LCM क्रमशः $3x + 1$ और $30x^3 + 7x^2 - 10x - 3$ है। यदि एक बहुपद $6x^2 + 5x + 1$ है तो दूसरा बहुपद क्या है?

(CDS 2021)

[A] $15x^2 + 4x + 3$ ✗

[B] $15x^2 + 4x - 3$ ✗

[C] $15x^2 - 4x + 3$ ✗

[D] $15x^2 - 4x - 3$ ✓

$$\textcircled{I} \times \textcircled{II} = \text{HCF} \times \text{LCM}$$

but $x=1$

$$(6x^2 + 5x + 1) \times ? = (3x + 1) \times (30x^3 + 7x^2 - 10x - 3)$$

$$12 \times ? = 4 \times 24$$

$$? = 8$$

Misc.



132. If $x = 106$, then find $x^5 - 107x^4 + 107x^3 - 107x^2 + 107x + 25$?

यदि $x = 106$ है, तो $x^5 - 107x^4 + 107x^3 - 107x^2 + 107x + 25$ ज्ञात कीजिये?

[A] 132

[B] 131

[C] 118

[D] -131

$$106 = x$$

$$107 = x + 1$$

$$\cancel{x^5 - (x+1)x^4 + (x+1)x^3 - (x+1)x^2 + (x+1)x + 25} \\ = 131$$

133. If $\frac{x}{b+c} = \frac{y}{c+a} = \frac{z}{b-a}$, then which one of the following is correct?

यदि $\frac{x}{b+c} = \frac{y}{c+a} = \frac{z}{b-a} = \text{माना}$

?

[A] $x + y + z = 0$

[C] $x + y - z = 0$

✓ [B] $x - y - z = 0$

[D] $x + 2y + 3z = 0$

$$\begin{cases} x = b+c \\ y = c+a \\ z = b-a \end{cases}$$

$$x - y = b - a$$

$$x - y = z$$



Algebra end

