

#

$$x^2 - (\text{sum of roots})x + \text{Product of Roots} = 0$$



102. If α and β are the roots of the equation $x^2 - 6x - 5 = 0$, then find the equation having the roots 3α and 3β .

यदि α और β समीकरण $x^2 - 6x - 5 = 0$ के मूल हैं, तो 3α और 3β मूलों वाला समीकरण ज्ञात कीजिए।

[A] $x^2 - 18x - 48 = 0$

[B] $x^2 - 18x - 45 = 0$

[C] $x^2 - 15x + 48 = 0$

[D] $x^2 - 15x + 45 = 0$

$$\alpha + \beta = 6$$

$$\alpha\beta = -5$$

$$3\alpha + 3\beta = 3 \times 6 = 18$$

$$3\alpha \times 3\beta = 9\alpha\beta = 9 \times -5 = -45$$

$$x^2 - 18x - 45 = 0$$

103. If α, β are the roots of the equation $8x^2 - 3x + 27 = 0$, then the value of $(\frac{\alpha^2}{\beta})^{1/3} + (\frac{\beta^2}{\alpha})^{1/3}$ is?

यदि α, β समीकरण $8x^2 - 3x + 27 = 0$ के मूल हैं, तो $(\frac{\alpha^2}{\beta})^{1/3} + (\frac{\beta^2}{\alpha})^{1/3}$ का मान ज्ञात कीजिये?

(SSC CGL MAINS 2017)

[A] $\frac{1}{3}$
[C] $\frac{1}{5}$

[B] $\frac{1}{4}$
[D] $\frac{1}{6}$

$$\frac{\alpha^{2/3}}{\beta^{1/3}} + \frac{\beta^{2/3}}{\alpha^{1/3}} = \frac{\alpha + \beta}{\alpha^{1/3} \beta^{1/3}} = \frac{3}{(\frac{27}{8})^{1/3}}$$

$$\alpha + \beta = \frac{3}{8}$$

$$\alpha \cdot \beta = \frac{27}{8}$$

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

$$\alpha^{2/3} \times \alpha^{1/3} = \alpha^1$$

$$\alpha^{1/3} \cdot \beta^{1/3} = (\alpha\beta)^{1/3}$$

$$= \frac{3}{\frac{27}{8}} = \frac{3 \times 8}{27} = \frac{8}{9}$$

104. If α and β are the roots of the equation $2x^2 - 2(n+1)x + (n^2 + n + 1) = 0$, then what is $(2\alpha^3 + 2\beta^3)$ equal to?

यदि α और β समीकरण $2x^2 - 2(n+1)x + (n^2 + n + 1) = 0$ के मूल हैं, तो $(2\alpha^3 + 2\beta^3)$ किसके बराबर है?

UPSC CDS (II) 2026

[A] $n^3 - 1 = 7$ ✗

[B] $1 - n^3$ ✗

~~[C]~~ $-(n^3 + 1) = -9$ ✓

[D] $-(2n^3 + 1)$ ✗

$$\alpha + \beta = (n+1) = 3$$

$$\alpha \cdot \beta = \frac{n^2 + n + 1}{2} = \frac{7}{2}$$

but $n=2$

$$= 2 \cdot (\alpha^3 + \beta^3)$$

$$= 2(\alpha + \beta) \cdot [(\alpha + \beta)^2 - 3\alpha\beta]$$

$$= 2 \times 3 \left[9 - 3 \times \frac{7}{2} \right]$$

$$= \cancel{6} \times \cancel{\frac{3}{2}}$$

$$= -9$$

105. Which of the following is the equation having inverse roots of the roots of the equation $5x^2 - 3x - 4 = 0$?

समीकरण $5x^2 - 3x - 4 = 0$ के मूलों के व्युत्क्रम मूलों वाला समीकरण निम्न में से कौन-सा है?

[RRB Group D-2022]

[A] $4x^2 - 3x + 5 = 0$

[C] $4x^2 + 3x + 5 = 0$

[B] $4x^2 - 3x - 5 = 0$

[D] $4x^2 + 3x - 5 = 0$

Trick →

(V.V.V.V.V) $x \rightarrow \frac{1}{x}$

α, β

$\frac{1}{\alpha}, \frac{1}{\beta}$

$x \rightarrow \frac{1}{x}$

$$\frac{5}{x^2} - \frac{3}{x} - 4 = 0$$

$$5 - 3x - 4x^2 = 0$$

$$4x^2 + 3x - 5 = 0$$

106. If $(p \neq 0)$ and $(q \neq 0)$ are the roots of the equation $x^2 + px + q = 0$, then what is $p^2 + q^2$ equal to?

यदि $(p \neq 0)$ और $(q \neq 0)$ समीकरण $x^2 + px + q = 0$ के मूल हैं, तो $p^2 + q^2$ किसके बराबर है?

(UPSC CDS-1 2025)

[A] 2

[B] 3

[C] 4

[D] 5



107. If α and β are the roots of the equation $x^2 - x - 6 = 0$, find the value of $\alpha^4 + \beta^4$.

यदि α और β , समीकरण $x^2 - x - 6 = 0$ के मूल हैं, तो $\alpha^4 + \beta^4$ का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

81 + 16

[A] 100

[B] 90

[C] 95

[D] 97

$$\begin{matrix} (3) + (-2) \\ \alpha + \beta = 1 \end{matrix}$$

$$\begin{matrix} \alpha \cdot \beta = -6 \\ 3 \times -2 \end{matrix}$$

108. If α & β are the roots of the equation $x^2 - 7x + 1 = 0$, then what is the value of $\alpha^4 + \beta^4$?

यदि α और β समीकरण $x^2 - 7x + 1 = 0$ के मूल हैं, तो $\alpha^4 + \beta^4$ का मान क्या है?

(CDS 2023)

[A] ~~2207~~

[B] 2247

[C] 2317

[D] 2337

$$\alpha^4 + \frac{1}{\alpha^4} =$$

$$\alpha + \beta = 7 \Rightarrow \alpha + \frac{1}{\alpha} = 7 \Rightarrow \alpha^2 + \frac{1}{\alpha^2} = 7^2 - 2 = 47$$

$$\alpha \cdot \beta = 1 \Rightarrow \beta = \frac{1}{\alpha}$$

$$\alpha^4 + \frac{1}{\alpha^4} = 47^2 - 2 = 2207$$

109. If α and β are the roots of equation $x^2 - 2x + 4 = 0$, then what is the equation whose roots are α^3/β^2 and β^3/α^2 ?

यदि α तथा β समीकरण $x^2 - 2x + 4 = 0$ के मूल हैं तो वह समीकरण क्या है जिसके मूल α^3/β^2 तथा β^3/α^2 हैं?

(SSC CGL MAINS 2017)

- [A] $x^2 - 4x + 8 = 0$ ✗ [B] $x^2 - 32x + 4 = 0$
[C] $x^2 - 2x + 4 = 0$ ✓ [D] $x^2 - 16x + 4 = 0$

$\neq$
 $\alpha^3 = -8$
 $\Rightarrow \alpha^3 = \beta^3 = -8$

$$\frac{\alpha^3}{\beta^2} = \frac{\alpha^3 \times \beta}{\beta^3} = \beta$$

$$\frac{\beta^3}{\alpha^2} = \frac{\beta^3 \times \alpha}{\alpha^3} = \alpha$$

$$x^2 - 2x + 4 = 0$$

$$x \in \alpha, \beta$$

$$x = \frac{2 \pm \sqrt{4 - 4 \times 1 \times 4}}{2}$$

$$= \frac{2 \pm 2\sqrt{3}i}{2}$$

~~$$= 1 \pm \sqrt{3}i$$~~

imaginary

$$\alpha = 1 + \sqrt{3}i$$

$$\beta = 1 - \sqrt{3}i$$



$$x^3 - 2x + 4 = 0$$

$$(x+2) \times (x^3 - 2x + 4) = 0 \times (x+2)$$

$$x^3 + 2^3 = 0$$

$$x^3 = -8$$

$$\Rightarrow \alpha^3 = \beta^3 = -8$$

$$\alpha \in (\alpha, \beta) \\ = 1 \pm \sqrt{3}i$$

$$\begin{aligned} & \cancel{(-2)^3 = -8} \\ & \checkmark (1 + \sqrt{3}i)^3 = -8 \\ & \checkmark (1 - \sqrt{3}i)^3 = -8 \end{aligned}$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

110. If α and β are the roots of equation $x^2 + 3x + 9 = 0$, then what is the equation whose roots are α^4 and β^4 ?

यदि α तथा β समीकरण $x^2 + 3x + 9 = 0$ के मूल हैं तो वह समीकरण क्या है जिसके मूल α^4 तथा β^4 हैं?

(SSC CGL MAINS 2017)

[A] $x^2 - 84x + 6561 = 0$ [B] $x^2 + 81x + 6561 = 0$

[C] $x^2 + 36x + 6561 = 0$ [D] $x^2 + 54x + 6561 = 0$

$$(x-3)x(x^2+3x+9)=0 \Rightarrow x(x-3)$$

$$x^3 - 3^3 = 0$$

$$x^3 = 27 \Rightarrow x^3 = \beta^3 = 27$$

$$\begin{aligned} \text{Sum} &\Rightarrow \alpha^4 + \beta^4 \\ &= 27\alpha + 27\beta \\ &= 27(\alpha + \beta) \\ &= 27(-3) \\ &= -81 \end{aligned}$$

$$\alpha^4 = \alpha^3 \times \alpha = 27\alpha$$

111. If α and β are the roots of equation $x^2 - x + 1 = 0$, Hence which equation will have roots α^{21} and β^{21} ?

यदि α तथा β समीकरण $x^2 - x + 1 = 0$ के मूल हैं, तो किस समीकरण के मूल α^{21} तथा β^{21} होंगे?
(SSC CGL MAINS 2017)

[A] $x^2 + 2x + 1 = 0$

[B] $x^2 - 2x + 1 = 0$

[C] $x^2 + x + 1 = 0$

[D] $x^2 - x + 1 = 0$

$$(\alpha + 1)(\alpha^2 - \alpha + 1) = 0 \Rightarrow (\alpha + 1) = 0$$

$$\Rightarrow \alpha^3 + 1 = 0$$

$$\alpha^3 = -1 \Rightarrow \alpha^3 = \beta^3 = -1$$

$$\alpha^{21} = (\alpha^3)^7 = (-1)^7 = -1$$

112. α and β are the roots of the quadratic equation $x^2 - x - 1 = 0$. then what is the equation whose roots are α^8 and β^8 ?

α और β द्विघत समीकरण $x^2 - x - 1 = 0$ के मूल हैं। तो वह समीकरण क्या है जिनके मूल α^8 तथा β^8 है?

(SSC CGL MAINS 2017)

[A] $x^2 - 47x + 1 = 0$

[B] $x^2 - 54x + 1 = 0$

[C] $x^2 - 59x + 1 = 0$

[D] $x^2 - 68x + 1 = 0$

$$\alpha^8 \neq \frac{1}{\alpha^8}$$

$$\text{Sum} = \alpha^8 + \frac{1}{\alpha^8} = 47$$

$$\alpha + \beta = 1 \Rightarrow \alpha - \frac{1}{\alpha} = 1$$

$$\alpha \cdot \beta = -1 \Rightarrow \beta = -\frac{1}{\alpha}$$

$$\alpha^3 + \frac{1}{\alpha^3} = 1^3 - 2 = 3$$

$$\alpha^4 + \frac{1}{\alpha^4} = 3^2 - 2 = 7$$

$$\alpha^8 + \frac{1}{\alpha^8} = 7^2 - 2 = 47$$

113. If α and β are the roots of the equation $x^2 + x - 1 = 0$, then what is the equation whose roots are α^5 and β^5 ?

यदि α तथा β समीकरण $x^2 + x - 1 = 0$ के मूल हैं तो वह समीकरण क्या है जिनके मूल α^5 तथा β^5 हैं?

(SSC CGL MAINS 2017)

[A] $x^2 + 7x - 1 = 0$

[B] $x^2 - 7x - 1 = 0$

[C] $x^2 - 11x - 1 = 0$

[D] $x^2 + 11x - 1 = 0$

H.W



(special case)



114. If $a + b + c = 0$, then what are the roots of the equation $ax^2 + bx + c = 0$?

यदि $a + b + c = 0$ है, तो समीकरण $ax^2 + bx + c = 0$ के मूल क्या हैं?

[RRB Group D-2022] (CDS 2023)

[A] $-2, \frac{c}{a}$

[B] $1, \frac{c}{a}$

[C] $-1, \frac{-c}{a}$

[D] $2, \frac{c}{a}$

$x = 1$

$1 \times a = \frac{c}{a}$

115. If the roots of the equation $a(b-c)x^2 + b(c-a)x + c(a-b) = 0$ are equal, then which of the following is true?

यदि समीकरण $a(b-c)x^2 + b(c-a)x + c(a-b) = 0$ के मूल बराबर हैं, तो निम्नलिखित में से कौन सा सही है?

(CDS 2023) (SSC CGL MAINS 2017)

- [A] $b = (a+c)/ac$ ~~[B] $2/b = 1/a + 1/c$~~
 [C] $2b = (1/a) + (1/c)$ ~~[D] $abc = ab + bc + ca$~~

$$x=1, 1$$

~~$$a(b-c) + b(c-a) + c(a-b) = 0$$~~

$$1 = \frac{ca - cb}{ab - ac}$$

$$ab - ac = ca - cb$$

$$ab + bc = 2ac \quad / \quad abc$$

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

116. let α & β be the roots of the equation $\frac{1}{x+a+b} = \frac{1}{x} + \frac{1}{a} + \frac{1}{b}$; $a \neq 0, b \neq 0, x \neq 0$. Which of the following is a quadratic equation whose roots are α^2 & β^2 ?

मान लीजिए α और β समीकरण $\frac{1}{x+a+b} = \frac{1}{x} + \frac{1}{a} + \frac{1}{b}$; $a \neq 0, b \neq 0, x \neq 0$ के मूल हैं। निम्नलिखित में से कौन सा एक द्विघात समीकरण है जिसके मूल α^2 & β^2 हैं?

(CDS 2023)

[A] $x^2 + (a^2 + b^2)x + a^2b^2 = 0$

[B] $x^2 - (a^2 + b^2)x + a^2b^2 = 0$

[C] $x^2 - (a^2 + b^2)x - a^2b^2 = 0$

[D] $x^2 + (a^2 + b^2)x - a^2b^2 = 0$

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

$$\frac{-(a+b)}{x \cdot (x+a+b)} = \frac{b+a}{ab}$$

$$x^2 + (a+b)x + ab = 0$$

$$\alpha = -a, \beta = -b$$

117. If α & β are the roots of the equation $x + a + b = \frac{abx}{ab+ax+bx}$, then what is $\alpha\beta + \alpha + \beta$ equal to?
यदि α और β समीकरण $x + a + b = \frac{abx}{ab+ax+bx}$ के मूल हैं, तो $\alpha\beta + \alpha + \beta$ किसके बराबर है?

(UPSC CDS-1 2025)

[A] $ab+a-b$

[B] $ab-a-b$

[C] $a+b-ab$

[D] $-(ab+a+b)$

H.W



118. If $\frac{1}{x+k} + \frac{1}{x+2k} + \frac{1}{x+5k} = \frac{1}{k}$, then what is the solution of the equation?

अगर $\frac{1}{x+k} + \frac{1}{x+2k} + \frac{1}{x+5k} = \frac{1}{k}$ है, तो इस समीकरण का हल क्या है?

UPSC CDS (II) 2026

[A] $\frac{k}{3}$

[B] $\frac{2k}{3}$

[C] $\frac{k}{2}$

~~[D]~~ **k**

$$x=k$$

$$\frac{1}{2k} + \frac{1}{3k} + \frac{1}{6k}$$

$$= \frac{\cancel{3} + \cancel{2} + 1}{6k}$$

$$= \frac{1}{k}$$

119. If ' α ' is one of the root of the equation $x^2 + 6x + 10 = 0$. The the value of $(\alpha + 1)(\alpha + 2)(\alpha + 4)(\alpha + 5)$ is

यदि ' α ' समीकरण $x^2 + 6x + 10 = 0$ का एक मूल है, तो $(\alpha + 1)(\alpha + 2)(\alpha + 4)(\alpha + 5)$ का मान क्या है?

[A] 10

[B] 12

[C] 8

[D] 16

put $x = \alpha$

$$= (\alpha^2 + 6\alpha + 5)(\alpha^2 + 6\alpha + 8)$$

$$= -5\alpha - 2$$
$$= 10$$

$$\alpha^2 + 6\alpha + 10 = 0$$
$$\Rightarrow \alpha^2 + 6\alpha = -10$$

$$4x^2 + 3x - 7 = 0$$

$\times 2$

$$8x^2 + 6x - 14 = 0$$

same
roots α, β

$\neq$

if $a_1x^2 + b_1x + c_1 = 0$

✓

$$a_2x^2 + b_2x + c_2 = 0$$

तो $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

अर्थात्
Have two common roots

120. If the quadratic equations $4x^2 + bx + 3 = 0$ and $8x^2 + 4x + c = 0$ have both the roots common, find the values for b and c , respectively.

यदि द्विघात समीकरण $4x^2 + bx + 3 = 0$ और $8x^2 + 4x + c = 0$ में दोनों मूल सार्व हों, तो क्रमशः b और c के मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL 2025 CBT-1)

[A] 6, 2

[B] 2, 4

[C] 4, 2

[D] 2, 6

$$b=2$$

$$c=6$$

121. Find the value of K if the quadratic equations $2x^2 + Kx + 8 = 0$ and $3x^2 + 4x + 12 = 0$ have both roots common.

यदि द्विघात समीकरण $2x^2 + Kx + 8 = 0$ और $3x^2 + 4x + 12 = 0$ के दोनों मूल सार्व हैं, तो K का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] $\frac{8}{3}$
[C] $\frac{5}{3}$

[B] $\frac{3}{2}$
[D] $\frac{7}{2}$

$$\frac{2}{3} = \frac{K}{4}$$

122. Consider a quadratic equation $3x^2 + 4x - 8 = 0$. Which of the following quadratic equations will have both roots common with the given quadratic equation?

एक द्विघात समीकरण $3x^2 + 4x - 8 = 0$ पर विचार करें। निम्नलिखित में से किस द्विघात समीकरण के दोनों मूल, दिए गए द्विघात समीकरण के साथ उभयनिष्ठ हैं?

(RRB JE 2025)

[A] $3x^2 - 4x + 8 = 0$ ✗

[B] $-1.5x^2 - 2x + 4 = 0$ ✓

[C] $3x^2 + 4x + 8 = 0$ ✗

[D] $-1.5x^2 + 2x + 4 = 0$

$1.5x^2 + 2x - 4 = 0$

123. For what value of k do the quadratic equations: $2x^2 - 5x + 3 = 0$ and $4x^2 - (k+1)x + 6 = 0$, have both roots common?

k के किस मान के लिए द्विघात समीकरण $2x^2 - 5x + 3 = 0$ और $4x^2 - (k+1)x + 6 = 0$ के दोनों मूल सार्व (common) हैं?

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] 9

[B] 11

[C] 7

[D] 5

$$k+1=10$$

124. If both roots of the quadratic equation, $x^2 + 3x + 2 = 0$, are also roots of another quadratic equation, $ax^2 + bx + c = 0$, then which of the following must be true?

यदि द्विघात समीकरण $x^2 + 3x + 2 = 0$ के दोनों मूल एक अन्य द्विघात समीकरण $ax^2 + bx + c = 0$ के भी मूल हैं, तो निम्न में से कौन-सा सत्य होना चाहिए?

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] $a + 3b + 2c = 0$

[B] $a = b = c$

[C] $\frac{a}{1} = \frac{b}{2} = \frac{c}{3}$

[D] $ax^2 + bx + c$ must be a multiple of $x^2 + 3x + 2$

125. If both the roots of the quadratic equation $A(8x^2 + 4) + Bx + 4x^2 - 8 = 0$ and $3A(2x^2 + 1) + Kx + 3x^2 - 6 = 0$ are common, then what is the value of $9B^2 - 16K^2$?

यदि द्विघात समीकरण $A(8x^2 + 4) + Bx + 4x^2 - 8 = 0$ और $3A(2x^2 + 1) + Kx + 3x^2 - 6 = 0$ दोनों के मूल उभयनिष्ठ हैं, तो $9B^2 - 16K^2$ का मान क्या है?

(RRB NTPC GRADUATE LEVEL 2025 CBT-1)

[A] -1

[B] 1

[C] 2

[D] 0

$$\frac{8A+4}{6A+3} = \frac{B}{K}$$

$$(8A+4)x^2 + Bx + (4A-8) = 0$$

$$\frac{4}{3} = \frac{B}{K}$$

$$(6A+3)x^2 + Kx + (3A-6) = 0$$

$$(4K)^2 = (3B)^2$$

$$16K^2 = 9B^2$$

126. If a is a positive integer such that the equations $(a^2 - 7a)x^2 + x + 12 = 0$ and $240x^2 + 8x + (a^2 - 4) = 0$ both have roots common, then the value of $\frac{(a+2)(a+3)}{a-4}$ is:

यदि a एक इस प्रकार धनात्मक पूर्णांक है कि समीकरण $(a^2 - 7a)x^2 + x + 12 = 0$ तथा $240x^2 + 8x + (a^2 - 4) = 0$ दोनों के मूल उभयनिष्ठ हैं, तो $\frac{(a+2)(a+3)}{a-4}$ का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL 2025 CBT-1)

[A] 18

[B] 26

[C] 30

[D] 42

$$\frac{a^2 - 7a}{240} = \frac{1}{8} = \frac{12}{a^2 - 4}$$

$$(a^2 - 7a)x^2 + x + 12 = 0$$

$$240x^2 + 8x + (a^2 - 4) = 0$$

$$a^2 - 4 = 96$$

$$a^2 = 100$$

$$a = 10$$

only one roots common

#



127. The common root of the equations $x^2 - 21x + 110 = 0$ and $110 + x - x^2 = 0$, is:

समीकरणों $x^2 - 21x + 110 = 0$ और $110 + x - x^2 = 0$ का उभयनिष्ठ मूल है:

(RRB NTPC GRADUATE LEVEL CBT-1 2026)

[A] 11

[B] 10

[C] -11

[D] -10

$$x^2 - 21x + 110 = 0 \Rightarrow \quad +11, +10$$

$$x^2 - 1x - 110 = 0 \Rightarrow \quad +11, -10$$

128. Find the value of 'c' so that the quadratic equation $2x^2 - 3x + c = 0$ and $x^2 - 9x - 22 = 0$ may have one common root 11.

'c' का मान ज्ञात कीजिए ताकि द्विघात समीकरण $2x^2 - 3x + c = 0$ और $x^2 - 9x - 22 = 0$ का एक उभयनिष्ठ मूल 11 हो।

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] -157

[B] -237

[C] -107

[D] -209

$$2x^2 - 3x + c = 0$$

$$x^2 - 9x - 22 = 0$$

129. If 3 is a common root of quadratic equations $x^2 - 8x + P = 0$ and $x^2 + 4x + Q = 0$, then find the value of $P + Q$.

यदि द्विघात समीकरण $x^2 - 8x + P = 0$ और $x^2 + 4x + Q = 0$ का सार्व मूल 3 है, तो $P + Q$ का मान ज्ञात कीजिए। 15-21

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] 3

[B] ~~-6~~

[C] 6

[D] -3

$$9 - 24 + P = 0$$

$$9 + 12 + Q = 0$$

130. If the quadratic equations $6x^2 - 7x - 20 = 0$ and $6x^2 + bx - 10 = 0$ have one root in common, find the value of b.

यदि द्विघात समीकरण $6x^2 - 7x - 20 = 0$ और $6x^2 + bx - 10 = 0$ में एक मूल सार्व है, तो b का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] -11

[C] 10

[B] 11

[D] -10

$$\frac{75}{2} + \frac{5b}{2} - 10 = 0$$

$$75 + 5b - 20 = 0$$

$$5b = -55$$

$$b = -11$$

$$\frac{+15}{6}, \frac{-8}{6}$$

$$\frac{5}{2}, \frac{-4}{3}$$

root 8

$$-120$$

131. Two quadratic equations, $x^2 - 5x + 6 = 0$ and $2x^2 - kx + 6 = 0$, have one common root. What is the possible value of k ?

दो द्विघात समीकरण, $x^2 - 5x + 6 = 0$ और $2x^2 - kx + 6 = 0$, का एक मूल साव है। k का संभावित मान क्या है?

(RRB NTPC GRADUATE LEVEL 2025 CBT-1)

[A] 5

[B] 11

[C] 7

[D] 9

132. If $x^2 - kx - 49 = 0$ and $x^2 - 5kx + 11 = 0$ ($k > 0$) have a common root, then the value of k is:

यदि $x^2 - kx - 49 = 0$ और $x^2 - 5kx + 11 = 0$ ($k > 0$) का एक उभयनिष्ठ मूल हो, तो k का मान ज्ञात कीजिए।

(RRB JE 2025)

[A] $\frac{15}{4}$
[C] $\frac{15}{2}$

[B] $\frac{15}{7}$
[D] $\frac{15}{8}$

$$x^2 - kx - 49 = 0$$

$$x^2 - 5kx + 11 = 0$$

$$4kx - 60 = 0$$

$$4kx = 60$$

$$kx = 15 \Rightarrow x = \frac{15}{k}$$

$$\left(\frac{15}{k}\right)^2 - 15 - 49 = 0$$

$$\left(\frac{15}{k}\right)^2 = 64$$

$$\frac{15}{k} = 8$$

$$\frac{15}{8} = k$$

133. Two quadratic equations $x^2 + ax + 8 = 0$ and $x^2 + bx - 8 = 0$ have a common root then, find value of $a^2 - b^2$?

दो द्विघात समीकरण $x^2 + ax + 8 = 0$ और $x^2 + bx - 8 = 0$ का एक मूल उभयनिष्ठ है, तो $a^2 - b^2$ का मान ज्ञात कीजिए?

(CDS 2020)

[A] 48

[C] 16

[B] 32

[D] 36

$$(a^2 - b^2)\alpha = 32\alpha$$

$$+ \begin{array}{l} x^2 + ax + 8 = 0 \\ x^2 + bx - 8 = 0 \end{array}$$

$$(a-b) \cdot x = -16$$

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

$$2x^2 + (a+b)x = 0$$

$$2x + (a+b) = 0$$

134. The equations $x^2 - 5x + 6 = 0$ and $x^2 + ax + b = 0$, have exactly one common root, and the other root of the second equation is -4 . Among the following, which are the possible values of a and b ?

समीकरण $x^2 - 5x + 6 = 0$ और $x^2 + ax + b = 0$ का ठीक एक उभयनिष्ठ मूल है, और दूसरे समीकरण का दूसरा मूल -4 है। निम्नलिखित में से a और b के संभावित मान कौन-से हैं?

(RRB JE 2025)

[A] $a=3, b=-6$

[B] $a=1, b=12$

[C] $a=5, b=-20$

[D] $a=2, b=-8$

135. If the equations $x^2 - 3px + q = 0$ and $x^2 - 2kx + t = 0$ have one common root, and the first equation has equal roots, what is the value of $(t + q)^2$?

यदि समीकरण $x^2 - 3px + q = 0$ और $x^2 - 2kx + t = 0$ का एक सामान्य मूल है, और पहले समीकरण के मूल समान हैं, तो $(t + q)^2$ का मान क्या है?

[RRB NTPC GRADUATE LEVEL 2025 CBT-1]

[A] 0

[B] $4pk$

[C] $9p^2k^2$

[D] $(3p - 2k)$

$$\alpha^2 - 2k\alpha + t = 0$$

$$2\alpha = 3p$$

$$\alpha^2 = \frac{9}{4}p^2$$

$$9 - 3pk + t = 0$$

$$(t + q)^2 = (3pk)^2$$

136. The equation $x^2 + px + q = 0$ & $x^2 + qx + p = 0$ ($p \neq 0$) have a common root. What is the value of $(p+q)$?

समीकरण $x^2 + px + q = 0$ & $x^2 + qx + p = 0$ ($p \neq 0$) में एक उभयनिष्ठ मूल है। $(p+q)$ का मान क्या है?

(UPSC CDS-1 2025)

[A] -1

[C] 1

[B] 0

[D] 2

$$1 + p + q = 0$$

$$p + q = -1$$

$$x^2 + px + q = 0$$

$$x^2 + qx + p = 0$$

$$(p-q)x + (q-p) = 0$$

$$x = 1$$

$$(p-q)x = p-q$$

137. If the equations $x^2 + mx + 9 = 0$, $x^2 + nx + 17 = 0$ & $x^2 + (m+n)x + 35 = 0$ have a common negative root, then the value of $(2m+3n)$ is?

यदि समीकरण $x^2 + mx + 9 = 0$, $x^2 + nx + 17 = 0$ & $x^2 + (m+n)x + 35 = 0$ का एक उभयनिष्ठ नकारात्मक मूल है, तो $(2m+3n)$ का मान है?

(CAT 2024)

[A] 28

$m=6$

[B] 38

[C] 18

$n=\frac{26}{3}$

[D] None

$$x^2 + (m+n)x + 35 = 0$$

$$x^2 + mx + 9 = 0 \Rightarrow 9 - 3m + 9 = 0$$

$$x^2 + nx + 17 = 0 \Rightarrow 9 - 3n + 17 = 0$$

$$x^2 + (m+n)x + 26 = 0$$

$$\begin{aligned} x^2 - 9 &= 0 \\ x^2 &= 9 \\ x &= -3 \end{aligned}$$

138. Let a and b be roots of the equation $x^2 - 7x + c = 0$, and the roots of the equation $x^2 - dx + 216 = 0$ are a^2b and b^2a . The value of d is _____.

मान लीजिए a और b समीकरण $x^2 - 7x + c = 0$ के मूल हैं और समीकरण $x^2 - dx + 216 = 0$ के मूल a^2b और b^2a हैं, तो d का मान _____ है।

(RRB JE 2025)

[A] 48

[C] 45

[B] 42

[D] 40

$$a + b = 7$$

$$a \cdot b = c$$

$$a^2b + b^2a = d$$

$$ab(a + b) = d$$
$$6 \times 7 = d$$

$$a^2b \times b^2a = 216$$

$$(ab)^3 = 216$$

$$ab = 6$$