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ई-पाठशाला कार्यक्रम

Class 12th

MATHS

आव्यूह

5

RAPID REVISION

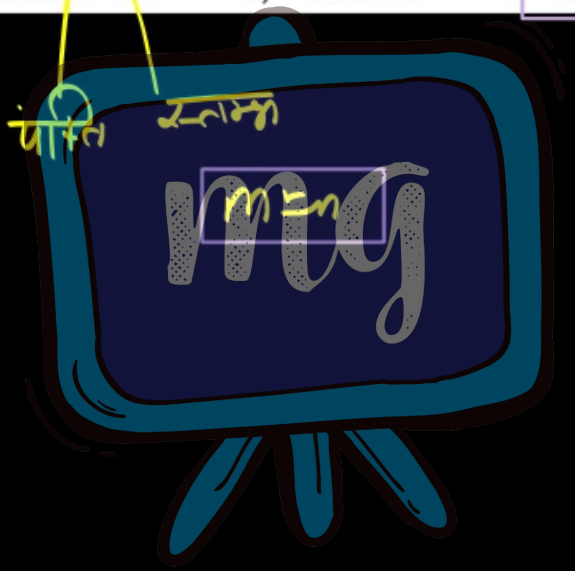


प्रश्न

$A = [a_{ij}]_{m \times n}$ एक वर्ग आव्यूह है यदि

अ) $m < n$ ब) $m > n$ स) $m = n$ द) इनमें से कोई नहीं

(2026)



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प्रश्न

यदि $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}$ तथा $B = \begin{bmatrix} 3 & -1 & 3 \\ -1 & 0 & 2 \end{bmatrix}$ हो, तो $(2A - B)$ होगा

अ) $\begin{bmatrix} -1 & 5 & 3 \\ 5 & 6 & 0 \end{bmatrix}$ ब) $\begin{bmatrix} 5 & -1 & 3 \\ 5 & 6 & 0 \end{bmatrix}$ स) $\begin{bmatrix} 2 & 4 & 6 \\ 4 & 6 & 2 \end{bmatrix}$ द) $\begin{bmatrix} -3 & 1 & -3 \\ 5 & 6 & 2 \end{bmatrix}$

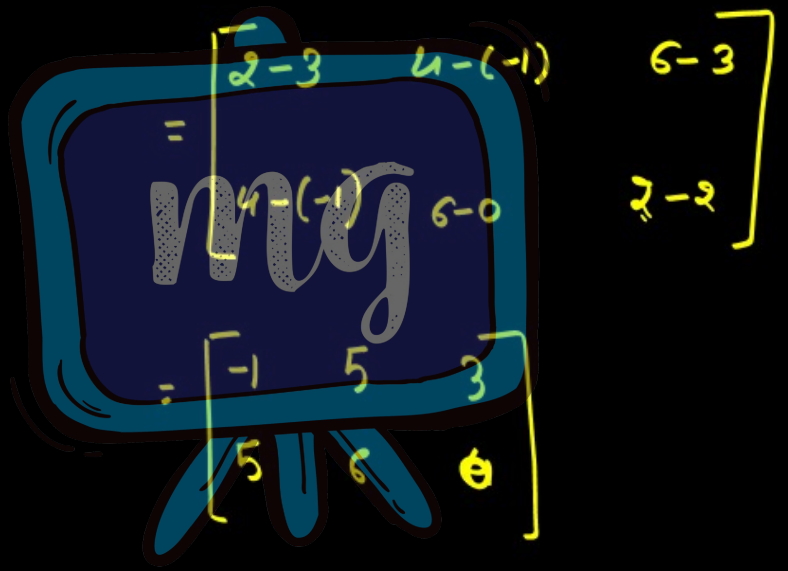
(2026)

$2A = 2\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix} = \begin{bmatrix} 2 & 4 & 6 \\ 4 & 6 & 2 \end{bmatrix}$

$2A - B = \begin{bmatrix} 2 & 4 & 6 \\ 4 & 6 & 2 \end{bmatrix} - \begin{bmatrix} 3 & -1 & 3 \\ -1 & 0 & 2 \end{bmatrix}$

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प्रश्न यदि $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$ और $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$ है, तो AB ज्ञात कीजिए । (2026)

हल:-

$$AB = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix} \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 2-8+6 & 3-10+3 \\ -8+8+10 & -12+10+5 \end{bmatrix} = \begin{bmatrix} 0 & 6-10 \\ 10 & -12+15 \end{bmatrix}$$

$$= \begin{bmatrix} 0 & -4 \\ 10 & 3 \end{bmatrix}$$

प्रश्न यदि $x\begin{bmatrix}2\\3\end{bmatrix}+y\begin{bmatrix}-1\\1\end{bmatrix}=\begin{bmatrix}10\\5\end{bmatrix}$ है, तो x तथा y के मान ज्ञात कीजिए ।

(2026)

हल:-

$$x\begin{bmatrix}2\\3\end{bmatrix}+y\begin{bmatrix}-1\\1\end{bmatrix}=\begin{bmatrix}10\\5\end{bmatrix}$$

$$\begin{bmatrix}2x\\3x\end{bmatrix}+\begin{bmatrix}-y\\y\end{bmatrix}=\begin{bmatrix}10\\5\end{bmatrix}$$

$$\begin{bmatrix}2x-y\\3x+y\end{bmatrix}=\begin{bmatrix}10\\5\end{bmatrix} \Rightarrow \begin{matrix}2x-y=10 \quad \text{—(i)}\\ 3x+y=5 \quad \text{—(ii)}\end{matrix}$$

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समी (i) और (ii) को जोड़ने पर

$$2x - y = 10$$
$$3x + y = 5$$
$$5x = 15$$
$$x = 3$$

x का मान समी. (ii) में रखने पर

$$3(3) + y = 5$$
$$9 + y = 5$$
$$y = -4$$

प्रश्न

$A = [a_{ij}]_{m \times n}$ एक स्तंभ आव्यूह होगा, यदि –

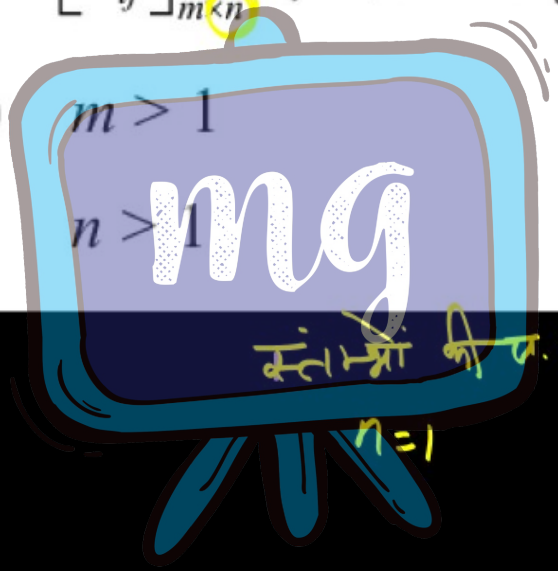
अ) $m > 1$

ब) $m = 1$

स) $n > 1$

द) $n = 1$

(2025)



प्रश्न यदि $A = \begin{bmatrix} -1 \\ 2 \end{bmatrix}$ तथा $B = \begin{bmatrix} -1 & 1 \end{bmatrix}$ हो, तो BA ज्ञात कीजिए।

AB — 2×1, 1×2 ⇒ 2×2

1×2

2×1

1×2, 2×1 ⇒ 1×1

(2025)

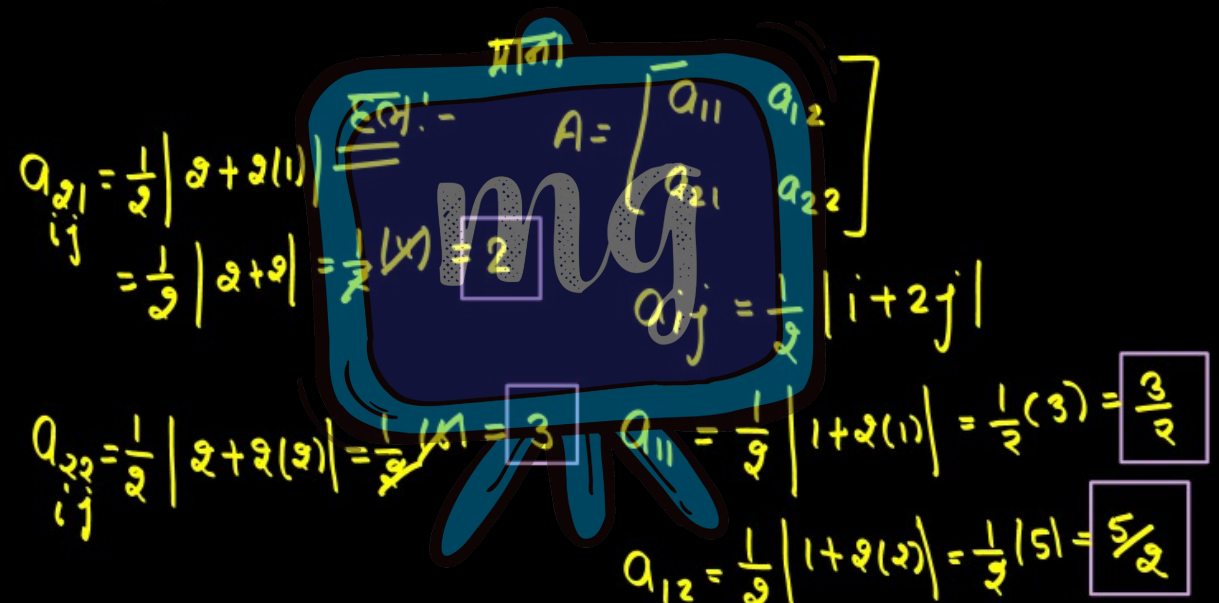
हल :- $BA = \begin{bmatrix} -1 & 1 \end{bmatrix} \begin{bmatrix} -1 \\ 2 \end{bmatrix}$

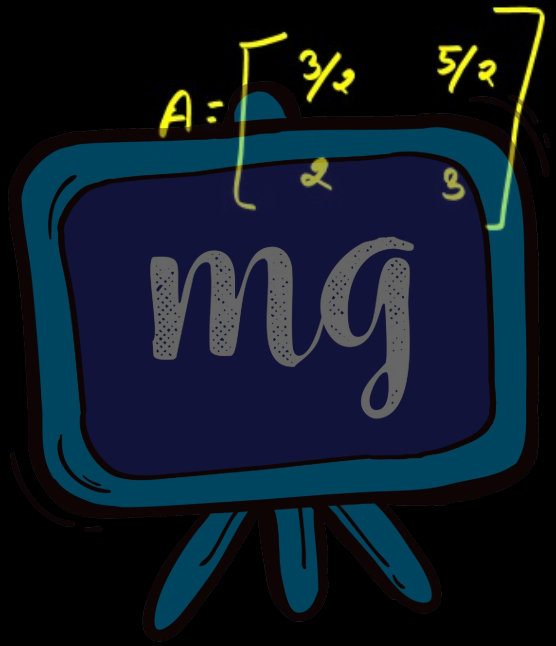
$= \begin{bmatrix} 1+2 \end{bmatrix}$

$= [3]$

प्रश्न एक ऐसे 2×2 आव्यूह $[a_{ij}]$ की रचना कीजिए, जिसके अवयव $a_{ij} = \frac{1}{2}|i + 2j|$ द्वारा प्रदत्त हो।

(2025)




A = [3/2 5/2
2 3
mg

प्रश्न

यदि $A=\begin{bmatrix}1 & 2 & 3\\ 2 & 3 & 1\end{bmatrix}$ तथा $B=\begin{bmatrix}3 & -1 & 3\\ -1 & 0 & 2\end{bmatrix}$ हैं, तो $(2A-B)$ होगा :

अ) $\begin{bmatrix}1 & -5 & 2\\ 5 & 6 & 0\end{bmatrix}$

ब) $\begin{bmatrix}5 & 6 & 0\\ 1 & -5 & 3\end{bmatrix}$

स) $\begin{bmatrix}-1 & 5 & 3\\ 5 & 6 & 0\end{bmatrix}$

द) $\begin{bmatrix}-1 & 3 & 5\\ 5 & 6 & 0\end{bmatrix}$

(2024)

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सरल कीजिए, $\cos\theta\begin{bmatrix}\cos\theta & \sin\theta\\ -\sin\theta & \cos\theta\end{bmatrix}+\sin\theta\begin{bmatrix}\sin\theta & -\cos\theta\\ \cos\theta & \sin\theta\end{bmatrix}$. (2024)

हल :-

$$\cos\theta\begin{bmatrix}\cos\theta & \sin\theta\\ -\sin\theta & \cos\theta\end{bmatrix}+\sin\theta\begin{bmatrix}\sin\theta & -\cos\theta\\ \cos\theta & \sin\theta\end{bmatrix}$$

$$=\begin{bmatrix}\cos^2\theta & \sin\theta\cos\theta\\ -\sin\theta\cos\theta & \cos^2\theta\end{bmatrix}+\begin{bmatrix}\sin^2\theta & -\cos\theta\sin\theta\\ \sin\theta\cos\theta & \sin^2\theta\end{bmatrix}$$

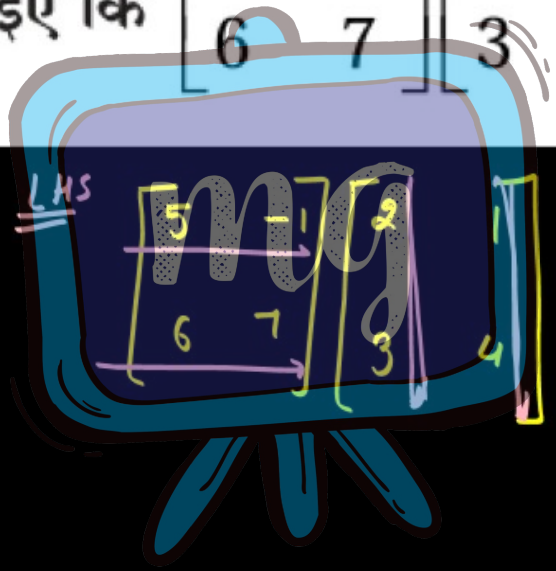
$$=\begin{bmatrix}\cos^2\theta+\sin^2\theta & \sin\theta\cos\theta-\cos\theta\sin\theta\\ -\sin\theta\cos\theta+\cos\theta\sin\theta & \sin^2\theta+\cos^2\theta\end{bmatrix}=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}=I$$


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प्रश्न दर्शाइए कि $\begin{bmatrix} 5 & -1 \\ 6 & 7 \end{bmatrix}\begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix} \neq \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 5 & -1 \\ 6 & 7 \end{bmatrix}$. (2024)



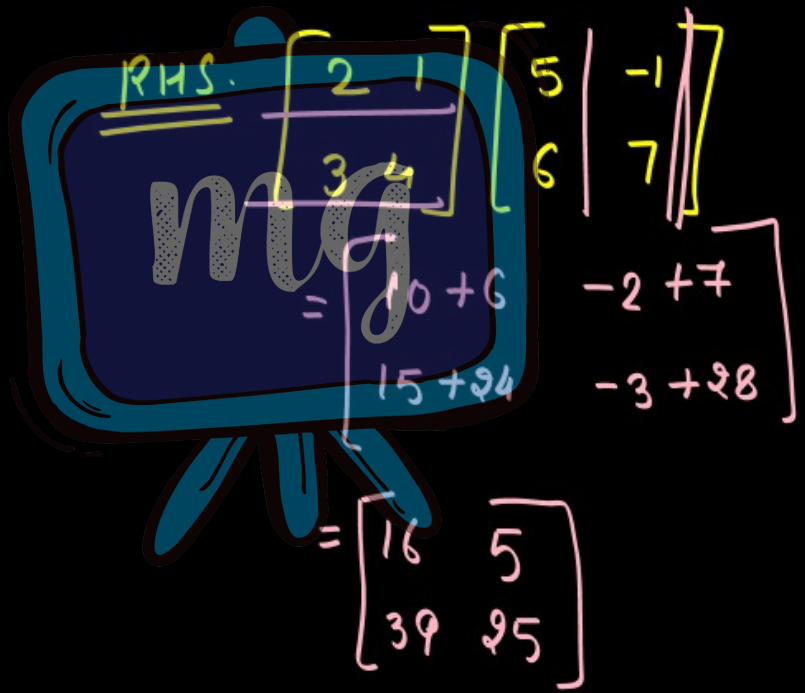
LHS $= \begin{bmatrix} 5 & -1 \\ 6 & 7 \end{bmatrix}\begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix} = \begin{bmatrix} 10-3 & 5-4 \\ 12+21 & 6+28 \end{bmatrix}$

$= \begin{bmatrix} 7 & 1 \\ 33 & 34 \end{bmatrix}$

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LHS ≠ RHS



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प्रश्न यदि किसी आव्यूह की कोटि $m \times n$ हैं, तो इसमें अवयवों की संख्या हैं –

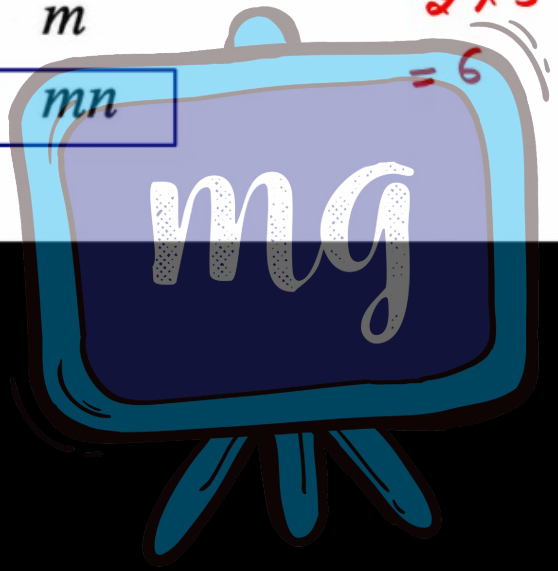
अ) m

ब) n

स) mn

द) $m - n$

$2 \times 3 = 6$



(2023)

प्रश्न यदि $x\begin{bmatrix}2\\3\end{bmatrix}+y\begin{bmatrix}-1\\1\end{bmatrix}=\begin{bmatrix}10\\5\end{bmatrix}$ हो, तो $(x+y)=$ ..... होगा।

(2023)

$x\begin{bmatrix}2\\3\end{bmatrix}+y\begin{bmatrix}-1\\1\end{bmatrix}=\begin{bmatrix}10\\5\end{bmatrix}$

$x=3,\ y=-4$

$x+y=3+(-4)$

$=-1$

प्रश्न निम्नलिखित समीकरण से x तथा y के मानों को ज्ञात कीजिए :

$$2\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$

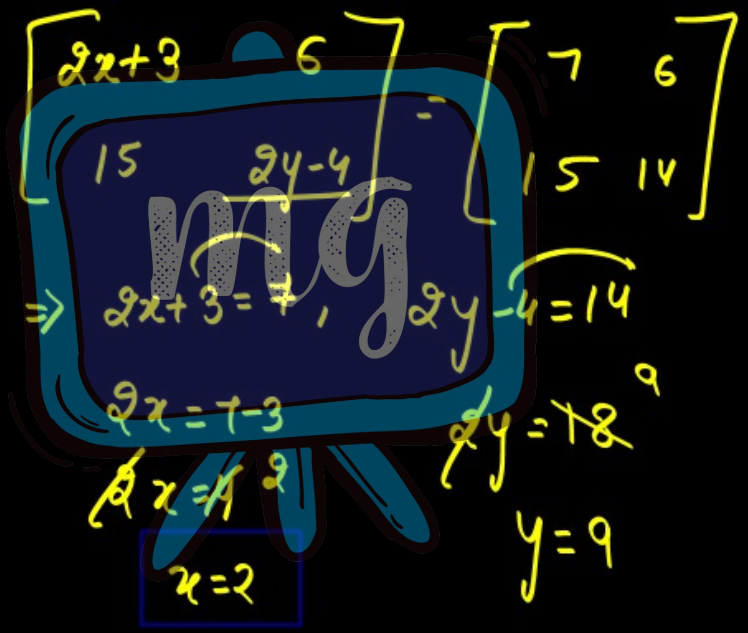
(2023)

$$2\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$

$$\begin{bmatrix} 2x & 10 \\ 14 & 2y-6 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$

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यदि $A=\begin{bmatrix}\sin\alpha & \cos\alpha\\ -\cos\alpha & \sin\alpha\end{bmatrix}$ हो, तो सत्यापित कीजिए $A'A=I$

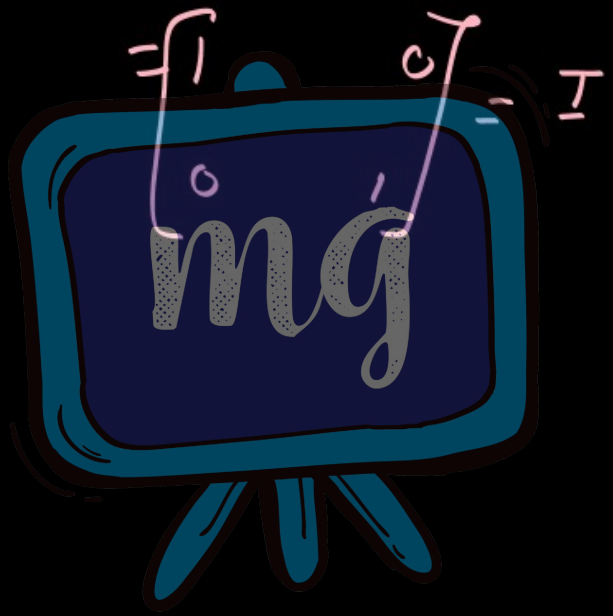
(2023)

हल:-

$$A=\begin{bmatrix}\sin\alpha & \cos\alpha\\ -\cos\alpha & \sin\alpha\end{bmatrix},\quad A'=\begin{bmatrix}\sin\alpha & -\cos\alpha\\ \cos\alpha & \sin\alpha\end{bmatrix}$$

$$A'A=\begin{bmatrix}\sin\alpha & -\cos\alpha\\ \cos\alpha & \sin\alpha\end{bmatrix}\begin{bmatrix}\sin\alpha & \cos\alpha\\ -\cos\alpha & \sin\alpha\end{bmatrix}$$

$$=\begin{bmatrix}\sin^2\alpha+\cos^2\alpha & \sin\alpha\cos\alpha-\cos\alpha\sin\alpha\\ \cos\alpha\sin\alpha-\sin\alpha\cos\alpha & \cos^2\alpha+\sin^2\alpha\end{bmatrix}$$


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यदि $A = \begin{bmatrix} 2 & -3 \\ 1 & 2 \end{bmatrix}$ और $B = \begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$ हो, तो AB होगा।

(अ) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

(ब) $\begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$

(स) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

(द) $\begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}$

(2022)

$AB = \begin{bmatrix} 2 & -3 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} -4-3 & 6-6 \\ -2+2 & 3+4 \end{bmatrix}$

$= \begin{bmatrix} -7 & 0 \\ 0 & 7 \end{bmatrix}$