MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

SYSTEM OF LINEAR EQUATIONS

Solved Examples

1. Use matrix method to show that the system that the system of equation

$2x + 5y = 7$

$6x + 15y = 13$

is inconsistent

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2. Use matrix method to show that the following system of equation is inconsistent

3x-y+2z=3

2x+y+3z=5

x-2y-z=1

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3. Solve the system of equations $2x + 5y = 1$

$3x + 2y = 7$

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4. If $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 3 & 2 \\ 3 & -3 & -4 \end{bmatrix}$ then find A^{-1} and hence solve the follwoing equations:

$x + 2y - 3z = 4, 2x + 3y + 2z = 2$ and $3x - 3y - 4z = 11$

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5. Using matrix method, solve the following system of linear equations. $3x + 4y + 2z = 8, 2y - 3z = 3$ and $x - 2y + 6z = -2$

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6. Using matrix method, solve the following system of equations: $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4, \frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1, \frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2; x, y, z \neq 0$

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7. Use product $[1 - 1202 - 33 - 24]\ [-20192 - 361 - 2]$ to solve the system of equation: $x - y + 2z = 1 \quad 2y - 3z = 1$ $3x - 2y + 4z = 2$

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8. Given $A = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$, find AB and use this result in solving the following system of equation

x-y+z=4,

x-2y-2z=9

2x+2y+3z=1

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9. The sum of three numbers is 6. If we multiply the third number 2 and add the first number to the result, we get 7. Be adding second and third numbers to three times the first number we get 12. Use determinants to find the numbers.

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10. A school wants to award its students for the value of honesty, regularity and hard work will total cash award of Rs. 6000. Three times the award money for hard work added to that added to that given for honesty amounts to Rs. 11000. The award money given for honesty and hard work together is double the one given for regularity. Represent the above situation algebraically and find the award money for each value, using matrix method.

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Exercise 8 A

1. x+2y=9

2x+4y=7

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2. $2x+3y=5$

$6x+9y=10$

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3. $4x-2y=3$

$6x-3y=5$

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4. $6x+4y=5$

$9x+6y=8$

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

$x-2y+z=4$

-2x+y+z=4

show that each of the follwing is inconsistent

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6. 2x-y+3z=1

3x-2y+5z=-4

5x-4y+9z=14

show that it is inconsistent

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7. x+2y+4z=12

y+2z=-1

3x+2y+4z=4

show that it is inconsistent

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8. Show that following system of linear equations is inconsistent:

$3x - y - 2z = 2, \quad 2y - z = -1, \quad 3x - 5y = 3$

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9. 5x+2y=4

7x+3y=5

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10. 3x+4y-5=0

x-y+3=0

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11. Solve: $x+2y=1$

$3x+y=4$

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12. $5x+7y+2=0$

$4x+6y+3=0$

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13. $2x-3y+1=0$

$x+4y+3=0$

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14. Solve system of linear equations, using matrix method,$4x3y = 3$

$3x5y = 7$

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15. 2x+8y+5z=5

x+y+z=-2

x+2y-z=2

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16. x-y+z=1

2x+y-z=2

x-2y-z=4

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17. $3x+4y+7z=4$,

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

$x+2y+3z=8$.

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18. $x+2y+z=7$

$x+3z=11$

$2x-3y=1$

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19. $2x-3y+5z=16$,

$3x+2y-4z=-4$,

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

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20. x+y+z=4

2x-y+z=-1

2x+y-3z=-9

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21. Using matrices, solve the following system of equations:

$2x = 3y + 5z = 11\ 3x + 2y - 4z = \ -5$

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22. x+y+z=1

x-2y+3z=2

5x-3y+z=3

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23. x+y+z=6

x + 2z =7,

3x + y + z = 12

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24. 2x+3y+3z=5

x-2y+z=-4

3x-y-2z=3

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25. 4x -5y-11z=12,.

x-3y+z=1

2x + 3y-7z = 2

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26. Solve system of linear equations, using matrix method, in questions 7 to 14.

x-y+2z=7, 3x+4y-5z=-5, 2x-y+3z=12

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27. 6x-9y-20z=-4

4x-15y+10z=-1

2x-3y-5z=-1

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28. 3x-4y+2z=-1

2x+3y+5z=7

x+z=2

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29. $x+y-z=1$

$3x+y-2z=3$

$x-y-z=-1$

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30. $2x+y-z=1$

$x-y+z=2$

$3x+y-2z=-1$

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31. $x+2y+z=4$

$-x+y+z=0$

$x-3y+z=4$

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32. x-y-2z=3

x+y=1

x+z=-6

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33. By using matrix method find the value of x, y, z

$5x - y = -7$

$2x + 3z = 1$

$3y - z = 5$

find the value of x,y,z

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34. x-2y+z=0

y-z=2

2x-3z=10

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35. x-y=3

2x+3y+4z=17

y+2z=7

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36. find the value of x, y, z with the help of determinant method

4x+3y+2z=60

x+2y+3z=45

6x+2y+3z=70

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37. If $A = \begin{pmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{pmatrix}$ find A^{-1}. Use it to solve the system of equations $2x - 3y + 5z = 11$, $3x + 2y - 4z = -5$ and $x + y - 2z = -3$

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38. Solve system of linear equations, using matrix method, $2x + y + z = 1x - 2y - z = \frac{3}{2}3y - 5z = 9$

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39. If $A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 2 & -6 \\ -2 & 1 & -3 \\ -4 & 2 & 5 \end{bmatrix}$, find AB

Hence , solve the system of equation

x-2y=10, 2x+y+3z=8 and -2y+z=7.

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Exercise 8 A Using Matrices Solve The Following System Of Equations

1. Solve the following system of equations by matrix method :

$x + y - 2 = 3 \quad 2x + 3y + z = 10 \quad 3x - y - 7z = 1 \quad x + y + z = 3$

$2x - y + z = -1 \qquad 2x + y - 3z = -9 \qquad 6x - 12y + 25z = 4$

$4x + 15y - 20z = 3 \qquad 2x + 18y + 15z = 10 \qquad 3x + 4y + 7z = 14$

$2x - y + 3z = 4 \qquad x + 2y - 3z = 0 \qquad \frac{2}{x} - \frac{3}{y} + \frac{3}{z} = 10$

$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 10 \qquad \frac{3}{x} - \frac{1}{y} + \frac{2}{z} = 13 \qquad 5x + 3y + z = 16$

$2x + y + 3z = 19 \; x + 2y + 4z = 25 \; 3x + 4y + 2z = 8 \; 2y - 3z = 3$

$x - 2y + 6z = -2 \qquad 2x + y + z = 2 \qquad x + 3y - z = 5$

$3x + y - 2z = 6 \quad 2x + 6y = 2 \quad 3x - z = -8 \quad 2x - y + z = -3$

$2y - z = 1 \qquad x - y + z = 2 \qquad 2x - y = 0 \qquad 8x + 4y + 3z = 18$

$2x + y + z = 5 \qquad x + 2y + z = 5 \qquad x + y + z = 6 \qquad x + 2z = 7$

$3x + y + z = 12 \qquad \frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4, \qquad \frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$

$\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2; \; x, y, z \neq 0 \qquad x - y + 2z = 7$

$3x + 4y - 5z = -5 \; 2x - y + 3z = 12$

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2.

$$1/x - \frac{1}{y} + \frac{1}{z} = 4, \frac{2}{x} + \frac{1}{y} - \frac{3}{z} = 0, \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 2(x, y, z \neq 0)$$

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Exercise 8 A Value Based Questions

1. The sum of three numbers is 2. If twice the second number is added to the sum of first and third, we get 1. On adding the sum of second and third numbers to five times the first, we get 6. Find the three numbers by using matrices.

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2. The cost of 4 kg potato, 3 kg wheat and 2 kg rice is x 60. The cost of 1 kg potato, 2 kg wheat and 3 kg rice is ? 45. The cost of 6 kg potato, 2 kg Wheat and 3 kg rice is ? 70. Find the cost of each item per kg by matrix method.

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3. An amount of Rs 5000 is put into three investments at the rate of interest of $6\%, 7\%$ and 8% per annum respectively. The total annual income is Rs 358. If the combined income from the first taoinvestments is Rs 70 more than the income from the third, find the amount of each investment by matrirx method

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4. Two schools P and Q want to award their selected students on the values of Tolerance, Kindness and Leadership. The school P wants to

award Rs. x each, Rs. y each and Rs. z each for the three respective values to 3, 2 and 1 students respectively with a total award money of Rs. 2,200. School Q wants to spend Rs. 3,100 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as school P). If the total amount of award for one prize on each value is Rs. 1,200, using matrices, find the award money for each value. Apart from these three values, suggest one more value which should be considered for award.

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Objective Questions

1. If A and B are 2-rowed square matrics such that $(A+B)=\begin{bmatrix}4 & -3\\ 1 & 6\end{bmatrix}$ and $(A-B)=\begin{bmatrix}-2 & -1\\ 5 & 2\end{bmatrix}$ then AB=?

A. $\begin{bmatrix}-7 & 5\\ 1 & -5\end{bmatrix}$

B. $\begin{bmatrix}7 & -5\\ 1 & 5\end{bmatrix}$

C. $\begin{bmatrix} 7 & -1 \\ 5 & -5 \end{bmatrix}$

D. $\begin{bmatrix} 7 & -1 \\ -5 & 5 \end{bmatrix}$

Answer: B

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2. If $\begin{bmatrix} 3 & -2 \\ 5 & 6 \end{bmatrix} + 2A = \begin{bmatrix} 5 & 6 \\ -7 & 10 \end{bmatrix}$ then A=?

A. $\begin{bmatrix} 1 & 3 \\ -5 & 4 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 5 \\ -3 & 4 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 4 \\ 6 & 2 \end{bmatrix}$

D. none of these

Answer: C

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3. If $A = \begin{bmatrix} 2 & 0 \\ -3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & -3 \\ -6 & 2 \end{bmatrix}$ are such that 4A+3X=5B then x=?

A. $\begin{bmatrix} 4 & -5 \\ -6 & 2 \end{bmatrix}$

B. $\begin{bmatrix} 4 & 5 \\ -6 & -2 \end{bmatrix}$

C. $\begin{bmatrix} -4 & 5 \\ 6 & -2 \end{bmatrix}$

D. none of these

Answer: A

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4. If $(A - 2B) = \begin{bmatrix} 1 & -2 \\ 3 & 0 \end{bmatrix}$ and $(2A - 3B) = \begin{bmatrix} -2 & 2 \\ 3 & -3 \end{bmatrix}$ then B=?

A. $\begin{bmatrix} 6 & -4 \\ -3 & 3 \end{bmatrix}$

B. $\begin{bmatrix} -4 & 6 \\ -3 & -3 \end{bmatrix}$

C. $\begin{bmatrix} 4 & -6 \\ 3 & -3 \end{bmatrix}$

D. none of these

Answer: B

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5. Find matrices A and B, if $2A - B = \begin{bmatrix} 6 & -6 & 0 \\ -4 & 2 & 1 \end{bmatrix}$ and $2B + A = \begin{bmatrix} 3 & 2 & 5 \\ -2 & 1 & -7 \end{bmatrix}$

A. $\begin{bmatrix} -3 & 2 & 1 \\ 2 & 1 & -1 \end{bmatrix}$

B. $\begin{bmatrix} 3 & 2 & -1 \\ 2 & -1 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 3 & 2 & -1 \\ -2 & 1 & -1 \end{bmatrix}$

D. none of these

Answer: C

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6. If $2\begin{bmatrix}3 & 4\\5 & x\end{bmatrix}+\begin{bmatrix}1 & y\\0 & 1\end{bmatrix}=\begin{bmatrix}7 & 0\\10 & 5\end{bmatrix}$ then

A. (x=-2,y=8)

B. (x=2,y=-8)

C. (x=3,y=-6)

D. (x=-3,y=6)

Answer: B

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7. If $\begin{bmatrix}x-y & 2x-y\\2x+z & 3z+w\end{bmatrix}=\begin{bmatrix}-1 & 0\\5 & 13\end{bmatrix}$

A. z=3,w=4

B. z=4,w=3

C. z=1,w=2

D. z=2,w=-1

Answer: A

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8. Solve for x and y, given that $\begin{bmatrix} x & y \\ 3y & x \end{bmatrix}\begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$.

A. x=1,y=2

B. x=2,y=1

C. x=1,y=1

D. none of these

Answer: C

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9. In the matrix $A = \begin{bmatrix} 3-2x & x+1 \\ 2 & 4 \end{bmatrix}$ is singular then X=?

A. 0

B. 1

C. -1

D. -2

Answer: B

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10. If $A_\alpha = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix} then (A_\alpha)^2 = ?$

A. $\begin{bmatrix} \cos^2\alpha & \sin^2\alpha \\ -\sin^2\alpha & \cos^2\alpha \end{bmatrix}$

B. $\begin{bmatrix} \cos 2\alpha & \sin 2\alpha \\ -\sin 2\alpha & \cos 2\alpha \end{bmatrix}$

C. $\begin{bmatrix} 2\cos\alpha & 2\sin\alpha \\ -\sin\alpha & 2\cos\alpha \end{bmatrix}$

D. none of these

Answer: B

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11. if $A = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$ be such that $A + A' = I$ then α

A. π

B. $\frac{\pi}{3}$

C. π

D. $\frac{2\pi}{3}$

Answer: B

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12. If $A = \begin{bmatrix} 1 & k & 3 \\ 3 & k & -2 \\ 2 & 3 & -4 \end{bmatrix}$ is singular then K=?

A. $\frac{16}{3}$

B. $\frac{34}{3}$

C. $\frac{33}{3}$

D. none of these

Answer: D

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13. If $A = [(a; b); (c; d)]$; find $adjA$

A. $\begin{bmatrix} d & -c \\ -b & a \end{bmatrix}$

B. $\begin{bmatrix} -d & b \\ c & -a \end{bmatrix}$

C. $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

D. $\begin{bmatrix} -d & -b \\ c & a \end{bmatrix}$

Answer: C

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14. If $A = \begin{bmatrix} 2x & 0 \\ x & x \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}$, then what is the value of x ?

A. 1

B. 2

C. $\frac{1}{2}$

D. -2

Answer: C

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15. If A and B are square matrics of the same order then (A+B)(A-B)=?

A. $\left(A^2 - B^2\right)$

B. $A^2 + AB - BA - B^2$

C. $A^2 - AB + BA - B^2$

D. none of these

Answer: C

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16. If A and B are square matrics of the same order then $(A + B)^2 = ?$

A. $A^2 + 2AB + B^2$

B. $A^2 + AB + BA + B^2$

C. $A^2 + 2BA + B^2$

D. none of these

Answer: B

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17. If A and B are square matrics of the same order then $(A-B)^2 = ?$

A. $A^2 - 2AB + B^2$

B. $A^2 - AB - BA + B^2$

C. $A^2 - 2BA + B^2$

D. none of these

Answer: B

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18. If A and B are symmetric matrices of the same order then (AB-BA) is always

A. a symmetric matrix

B. a skew symmetric matrix

C. a zero matrix

D. an identity matrix

Answer: B

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19. Matrices A and B will be inverse of each other only if (A) $AB = BA$ (B) $AB = BA = 0$ (C) $AB = 0, BA = I$ (D) $AB = BA = I$

A. AB=BA

B. AB=BA=O

C. AB=O,BA=I

D. AB=BA=I

Answer: D

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20. If A; B are non singular square matrices of same order; then $adj(AB) = (adjB)(adjA)$

A. (adjA)(adjB)

B. (adjB)(adjA)

C. |AB|

D. none of these

Answer: B

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21. If A is a 3-rowed square matrix and $|A|=4$ then $|adjA|=?$

A. 4A

B. 16A

C. 64A

D. none of these

Answer: A

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22. If A is a 3-rowed square matrix and $|A|=5$ then $|adjA|=?$

A. 5

B. 25

C. 125

D. none of these

Answer: B

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23. For any two matrices A and B , we have

A. AB=BA is always true

B. AB=BA is never true

C. sometimes AB=BA and sometimes AB $\neq$ BA

D. whenever AB exists , then BA exists

Answer: C

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24. Find a matrix X such that $X.\begin{bmatrix}3 & 2\\1 & -1\end{bmatrix}=\begin{bmatrix}4 & 1\\2 & 3\end{bmatrix}$.

A. $\begin{bmatrix}1 & -1\\1 & 1\end{bmatrix}$

B. $\begin{bmatrix}1 & 1\\-1 & 1\end{bmatrix}$

C. $\begin{bmatrix}1 & 1\\1 & -1\end{bmatrix}$

D. none of these

Answer: C

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25. If A is an invertible square matrix then $\left|A^{-1}\right|$=?

A. |A|

B. $\frac{1}{|A|}$

C. 1

D. 0

Answer: B

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26. If A; B are invertible matrices of the same order; then show that $(AB)^{-1} = B^{-1}A^{-1}$

A. $\left(A^{-1} \times B^{-1}\right)$

B. $\left(A \times B^{-1}\right)$

C. $\left(A^{-1} \times B\right)$

D. $\left(B^{-1} \times A^{-1}\right)$

Answer: D

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27. If A and B are two nonzero square matrices of the same order such that the product $AB = O$, then

A. |A|=0 or |B|=0

B. |A|=0 and |B|=0

C. $|A| \neq 0$ and $|B| \neq 0$

D. none of these

Answer: B

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28. If A is square matrix such that $|A| \neq 0$ and $A^2 - A + 2I = O$ then A^{-1}=?

A. (I-A)

B. (I+A)

C. $\frac{1}{2}(I - A)$

D. $\frac{I}{2}(I + A)$

Answer: C

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29. If $A = \begin{bmatrix} 1 & \lambda & 2 \\ 1 & 2 & 5 \\ 2 & 1 & 1 \end{bmatrix}$ is not invertible then λ=?

A. 2

B. 1

C. -1

D. 0

Answer: B

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30. If $A = \begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ then A^{-1} =?

A. A

B. $-A$

C. adjA

D. $= -adjA$

Answer: C

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31. If $A = \begin{bmatrix} ab & b^2 \\ -a^2 & -ab \end{bmatrix}$ then matrix A is (A) scalar (B) involuntary (C) idemponent (D) nilpotent

A. idempotent

B. orthgonal

C. nilpotent

D. none of these

Answer: C

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32. If $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ then A is `1) an idempotent matrix 2) nilpotent matrix 3) involutary 4) orthogonal matrix

A. nonsingular

B. idempotent

C. nilpoptent

D. orthogonal

Answer: B

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33. If A is singular then A(adjA)=?

A. a unit matrix

B. a null matrix

C. a symmetric

D. none of these

Answer: B

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34. if for any $2 \cdot 2$ square matrix A , $A(adjA) = \begin{bmatrix} 8 & 0 \\ 0 & 8 \end{bmatrix}$ then write the value of $\det. A$

A. 0

B. 8

C. 64

D. 4

Answer: B

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35. If $A = \begin{bmatrix} -2 & 3 \\ 1 & 1 \end{bmatrix}$ then $\left|A^{-1}\right|$=?

A. -5

B. $\frac{-1}{5}$

C. $\frac{1}{25}$

D. 25

Answer: B

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36. If $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find x and y such that $A^2 + xI = yA$.

A. x=6,y=6

B. x=8,y=8

C. x=5,y=8

D. x=6,y=8

Answer: B

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37. If matrices A and B anticommute then

A. AB=BA

B. AB=-BA

C. $(AB) = (BA)^{-1}$

D. NOne of these

Answer: B

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38. If $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$, find adj A.

A. $\begin{bmatrix} 3 & -5 \\ -1 & 2 \end{bmatrix}$

B. $\begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix}$

C. $\begin{bmatrix} -1 & 2 \\ 3 & -5 \end{bmatrix}$

D. none of these

Answer: A

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39. If $A = \begin{bmatrix} 3 & -4 \\ -1 & 2 \end{bmatrix}$ and B is a square matrix of order 2 such that AB=I then B=?

A. $\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$

B. $\begin{bmatrix} 1 & \frac{1}{2} \\ 2 & \frac{3}{2} \end{bmatrix}$

C. $\begin{bmatrix} 1 & 2 \\ \frac{1}{2} & \frac{3}{2} \end{bmatrix}$

D. none of these

Answer: C

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40. If A; B are invertible matrices of the same order; then show that $(AB)^{-1} = B^{-1}A^{-1}$

A. AB^{-1}

B. $A^{-1}B$

C. $A^{-1}B^{-1}$

D. $B^{-1}A^{-1}$

Answer: D

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41. If $A = \begin{bmatrix} 2 & -1 \\ 1 & 3 \end{bmatrix}$, $then A^{-1}$=?

A. $\begin{bmatrix} \frac{3}{7} & \frac{-1}{7} \\ \frac{1}{7} & \frac{2}{7} \end{bmatrix}$

B. $\begin{bmatrix} \frac{3}{7} & \frac{1}{7} \\ \frac{-1}{7} & \frac{2}{7} \end{bmatrix}$

C. $\begin{bmatrix} \frac{3}{7} & \frac{1}{7} \\ \frac{1}{7} & \frac{2}{7} \end{bmatrix}$

D. none of these

Answer: B

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42. If |A|=3 and $A^{-1} = \begin{bmatrix} 3 & -1 \\ \frac{-5}{3} & \frac{2}{3} \end{bmatrix}$ then adjA=?

A. $\begin{bmatrix} 9 & 5 \\ -5 & -2 \end{bmatrix}$

B. $\begin{bmatrix} 9 & -3 \\ -5 & 2 \end{bmatrix}$

C. $\begin{bmatrix} -9 & 3 \\ 5 & -2 \end{bmatrix}$

D. $\begin{bmatrix} 9 & -3 \\ 5 & -2 \end{bmatrix}$

Answer: B

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43. If A is an invertible matrix and $A^{-1} = \begin{bmatrix} 3 & 5 \\ 5 & 6 \end{bmatrix}$ then A=?

A. $\begin{bmatrix} 6 & -4 \\ -5 & 3 \end{bmatrix}$

B. $\begin{bmatrix} \frac{1}{3} & \frac{1}{4} \\ \frac{1}{5} & \frac{1}{6} \end{bmatrix}$

C. $\begin{bmatrix} -3 & 2 \\ \frac{5}{2} & \frac{-3}{2} \end{bmatrix}$

D. none of these

Answer: D

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44. If $A = [(1, 4), (4, -3)$ and $f(x) = 2x^2 - 4x + 5 then f(A)$ =?

A. $\begin{bmatrix} 19 & -32 \\ -16 & 51 \end{bmatrix}$

B. $\begin{bmatrix} 19 & -16 \\ -32 & 51 \end{bmatrix}$

C. $\begin{bmatrix} 19 & -11 \\ -27 & 51 \end{bmatrix}$

D. none of these

Answer: B

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45. If $A = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix} then A^2 - 4A$=?

A. I

B. 5I

C. 3I

D. O

Answer: B

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46. If A is 2-rowed square matrix and |A|=6 then A,adjA=?

A. $\begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$

B. $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

C. $\begin{bmatrix} \frac{1}{6} & 0 \\ 0 & \frac{1}{6} \end{bmatrix}$

D. none of these

Answer: A

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47. If A is 3×3 invertible matrix, then show that for any scalar k (non-zero),kA is invertible and $(kA)^{-1} = \frac{1}{k} A^{-1} I$

A. $k.\ A^{-1}$

B. $\frac{1}{k}.\ A^{-1}$

C. $-k.\ A^{-1}$

D. none of these

Answer: B

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48. If $A = \begin{bmatrix} 3 & 4 & 1 \\ 1 & 0 & -2 \\ -2 & -1 & 2 \end{bmatrix} then A^{-1}$=?

A. $\begin{bmatrix} 2 & 9 & -8 \\ -2 & 8 & 7 \\ -1 & 5 & -4 \end{bmatrix}$

B. $\begin{bmatrix} 2 & 9 & -8 \\ 2 & 8 & 7 \\ -1 & -5 & 4 \end{bmatrix}$

C. $\begin{bmatrix} -2 & -9 & -8 \\ 2 & 8 & 7 \\ -1 & 5 & -4 \end{bmatrix}$

D. none of these

Answer: C

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49. If A is a square matrix, then (1) AA' is symmetric (3) $A'A$ is skew - symmetric (2) AA' is skew - symmetric (4) A^2 is symmetric

A. a null matrix

B. an identity matrix

C. a symmetric matrix

D. a skew-symmetric matrix

Answer: C

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50. If A is a square matrix then $(A - A')$ is

A. a null matrix

B. an identity matrix

C. a symmetric matrix

D. a skew-symmetric matrix

Answer: D

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51. It A is 3-rowed square matrix and $|3A|=k|A|$ then k=?

A. 3

B. 9

C. 27

D. 1

Answer: C

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52. Which one of the following is a scalar matrix

A. $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

B. $\begin{bmatrix} 6 & 0 \\ 0 & 3 \end{bmatrix}$

C. $\begin{bmatrix} -8 & 0 \\ 0 & -8 \end{bmatrix}$

D. none of these

Answer: C

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53. If $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}, B = \begin{bmatrix} a & -1 \\ b & -1 \end{bmatrix}$ and $(A+B)^2 = (A^2 + B^2)$ then find the values of a and b.

A. a=2,b=-3

B. a=-2,b=3

C. a=1,b=4

D. none of these

Answer: C

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