1. Find whether the following pair of linear equations are consistent or inconsistent:
$$5x - 3y = 11,\ -10x + 6y = 22.$$

2. Solve for x and y:
$$x + y = 6,\ 2x - 3y = 4.$$

3. Find out wheather the pair of equations $2x + 3y = 0$ and $2x - 3y = 26$ is consistent or inconsistent.

4. For what values of k, does the pair of linear equations $kx - 2y = 3$ and $3x + y = 5$ have a unique solution?

5. What type of lines will you get by drawing the graph of the pair of equations $x - 2y + 3 = 0$ and $2x - 4y = 5$?

6. The sum of the numerator and the denominator of a fraction is 18. If the denominator is increased by 2, the fraction reduces to $\frac{1}{3}$. Find the fraction.

7. Find the value of k for which the system of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has no solution.

8. If 2 tables and 2 chairs cost | 700 and 4 tables and 3 chairs cost | 1,250, then find the cost of one table.

9. If the graph of a pair of lines $x - 2y + 3 = 0$ and $2x - 4y = 5$ be drawn, then what type of lines are drawn?

10. If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$, then A^2 equals

    (a) $\begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$

    (b) $\begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$

    (c) $\begin{bmatrix} -2 & -2 \\ -2 & 2 \end{bmatrix}$

    (d) $\begin{bmatrix} -2 & 2 \\ 2 & -2 \end{bmatrix}$

11. $\begin{vmatrix} 43 & 44 & 45 \\ 44 & 45 & 46 \\ 45 & 46 & 47 \end{vmatrix}$ equals

    (a) 0
    (b) -1
    (c) 1
    (d) 2

12. A square matrix A is said to be singular if ____________.

    If $A = \begin{bmatrix} 3 & -5 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 17 \\ 0 & -10 \end{bmatrix}$, then $|AB| =$ ____________.

13. If $\begin{bmatrix} 4 & x+2 \\ 2x-3 & x+1 \end{bmatrix}$ is a symmetric matrix, then find the value of x.

    If A is a square matrix such that $A^2 = A$, then find $(2 + A)^3 - 19A$.

14. For matrix $A = \begin{bmatrix} 2 & 3 \\ -4 & -6 \end{bmatrix}$, verify the following: $A(adjA) = (adjA)A = |A|I$

15. Using properties of determinants show that

$$\begin{vmatrix} 1+a^2-b^2 & 2ab & -2b \\ 2ab & 1-a^2+b & 2a \\ 2b & -2a & 1-a^2-b^2 \end{vmatrix} = (1+a^2+b^2)^3$$

16. Find the equation of the line joining $A(1,3)$ and $B(0,0)$, using determinants. Also, find k if $D(k,0)$ is a point such that the area of $\triangle ABD$ is 3 square units.

17. Solve the system of linear equations, using the matrix method:
$7x+2y=11$
$4x-7=2$

18. Find the Value of x, if
$\begin{bmatrix} \text{x} & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ -2 & -1 \end{bmatrix} \begin{bmatrix} \text{x} \\ 3 \end{bmatrix} = 0$

19. If A $= \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$, then $A^4 =$ ____________.

20. Given A $= \begin{bmatrix} 1 & -1 & 1 \\ 3 & -2 & 1 \\ -2 & 1 & 0 \end{bmatrix}$ and B $= \begin{bmatrix} 1 & 2 \\ 2 & 4 \\ 1 & -2 \end{bmatrix}$, the order of the matrix AB is ____________.

21. if $A = \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}$ $(i^2=-1)$ and B $= \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$, then AB is equal to

   (a) $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$
   (b) $\begin{bmatrix} i & 0 \\ 0 & -i \end{bmatrix}$
   (c) $\begin{bmatrix} i & -i \\ 0 & 1 \end{bmatrix}$
   (d) $\begin{bmatrix} 0 & 0 \\ i & 0 \end{bmatrix}$

22. If A is a $5 \times p$ matrix, B is a $2 \times q$ matrix, then the order of the matrix AB is 5×4. What are the values of $pandq$?

   (a) $p=2, q=4$
   (b) $p=4, q=2$
   (c) $p=2, q=2$
   (d) $p=4, q=4$

23. Value of k, for which $A = \begin{bmatrix} k & 8 \\ 1 & 2k \end{bmatrix}$ is a singular matrix is:

   (a) 4
   (b) -4
   (c) ± 4
   (d) 0

24. If $A = [a_i j]$ is a square matrix of order 2 such that $a_i = \begin{cases} 1, wheni+j \\ 0, wheni-j \end{cases}$, then A^2 is:

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

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

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

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

25. Given that A is a square matrix of order 3 and $|A| = -4$, then $|adj A|$ is equal to:

(a) -4
(b) 4
(c) -16
(d) 16

26. If $\begin{bmatrix} 2a+b & a-2b \\ 5c-d & 4c+3d \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 11 & 24 \end{bmatrix}$, then the value of $a+b-c+2d$ is:

(a) 8
(b) 10
(c) 4
(d) -8

27. Given that matrices A and B are of order $3 \times n$ and $m \times 5$ respectively, then the order of matrix $C = 5A + 3B$ is:

(a) 3×5
(b) 5×3
(c) 3×3
(d) 5×5

28. For matrix $A = \begin{bmatrix} 2 & 5 \\ -11 & 7 \end{bmatrix}$, $(\text{adj}A)'$ is equal to:

(a) $\begin{bmatrix} -2 & -5 \\ 11 & -7 \end{bmatrix}$

(b) $\begin{bmatrix} 7 & 5 \\ 11 & 2 \end{bmatrix}$

(c) $\begin{bmatrix} 7 & 11 \\ -5 & 2 \end{bmatrix}$

(d) $\begin{bmatrix} 7 & -5 \\ 11 & 2 \end{bmatrix}$

29. Given that $A = [a_{ij}]$ is a square matrix of order 3×3 and $|A| = -7$, then the value of $\sum_{i=1}^{3} a_{i2} A_{i2}$,where A_{ij} denotes the cofactor of element a_{ij} is:

(a) 7
(b) -7
(c) 0
(d) 49

30. If $A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$, then

   (a) $A^{-1} = B$
   (b) $A^{-1} = 6B$
   (c) $B^{-1} = B$
   (d) $B^{-1} = \frac{1}{6}A$

31. Given that A is a non-singular matrix of order 3 such that $A^2 = 2A$, then the value of $|2A|$ is:

   (a) 4
   (b) 8
   (c) 64
   (d) 16

32. If $A = \begin{bmatrix} 0 & 2 \\ 3 & -4 \end{bmatrix}$ and $kA = \begin{bmatrix} 0 & 3a \\ 2b & 24 \end{bmatrix}$, then the values of k,a and b respectively are

   (a) $-6, -12, -18$
   (b) $-6, -4, -9$
   (c) $-6, 4, 9$
   (d) $-6, 12, 18$

33. If A is square matrix such that $A^2 = A$, then $(I + A)^3 - 7A$ is equal to:

   (a) A
   (b) $I + A$
   (c) $I - A$
   (d) I

34. For $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, then 14^{-1} is given by:

   (a) $14 \begin{bmatrix} 2 & -1 \\ 1 & 3 \end{bmatrix}$
   (b) $\begin{bmatrix} 4 & -2 \\ 2 & 6 \end{bmatrix}$
   (c) $2 \begin{bmatrix} 2 & -1 \\ 1 & -3 \end{bmatrix}$
   (d) $2 \begin{bmatrix} -3 & -1 \\ 1 & -2 \end{bmatrix}$

35. Given that $A = \begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ and $A^2 = 3I$, then:

   (a) $1 + \alpha^2 + \beta\gamma = 0$
   (b) $1 - \alpha^2 - \beta\gamma = 0$
   (c) $3 - \alpha^2 - \beta\gamma = 0$
   (d) $3 + \alpha^2 + \beta\gamma = 0$

36. Let $A = \begin{bmatrix} 1 & sin\alpha & 1 \\ -sin\alpha & 1 & sin\alpha \\ -1 & -sin\alpha & 1 \end{bmatrix}$, where $0 \le \alpha \le 2\pi$, then:

(a) $|A| = 0$

(b) $|A| \varepsilon (2, \infty)$

(c) $|A| \varepsilon (2, 4)$

(d) $|A| \varepsilon |2, 4|$