

$$d) \begin{vmatrix} (y+z)^2 & xy & zx \\ xy & (x+z)^2 & yz \\ xz & yz & (x+y)^2 \end{vmatrix} = 2xyz(x+y+z)^3$$

$$e) \text{ If } \begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = 0, \text{ show that either } a+b+c = 0 \text{ or } a = b = c$$

12) Find the equation of the line joining (3,1) and (9,3) using determinants.

13) If area of the triangle is 35sq.units with vertices (2,-6), (5,4), (k,4). find the value of k.

$$14) A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}. \text{ Verify that } A^3 - 6A^2 + 9A - 4I = O. \text{ Hence find } A^{-1}.$$

15) Solve the following system of linear equations:

$$a) 2x + 3y + 3z = 5; x - 2y + z = -4; 3x - y - 2z = 3$$

$$b) \frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4; \frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1; \frac{6}{x} + \frac{9}{y} + \frac{20}{z} = 2$$

$$16) \text{ If } A = \begin{bmatrix} 1 & -1 & 2 \\ 1 & 2 & 2 \\ 1 & 1 & 1 \end{bmatrix} \text{ find } A^{-1} \text{ and hence solve : } x - y + 2z = 9; x + y + z = 2 \text{ and}$$

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

$$17) \text{ Determine the product } \begin{bmatrix} -4 & 4 & 4 \\ 7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix} \text{ and use it to solve the system}$$

of equations $x - y + z = 4; 2x + y + 3z = 1, x - 2y - 2z = 9$

18) Two schools A and B 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 Rs 2200. School Q wants to spend Rs 3100 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 1200, using matrices, find the award money for each value.

Apart from these three values, suggest one more value which should be considered for award.