Question 1

Use the following Methods to find the solution to the given system.

a) Substitution
b) Augmented matric (Gaussian Elimination method)
c) Gauss- Jordan

$$x - 7y = -1$$

$$5x + 2y = -18$$

Question 2

Use the following Methods to find the solution to the given system.

a) Substitution
b) Augmented matric (Gaussian Elimination)
c) Gauss- Jordan

$$2x - 5y + 2z = -38$$
$$3x - 2y + 4z = 17$$
$$-6x + y - 7z = -12$$

Question 3

Find the value of each determinant.

11. $\begin{vmatrix} -2 & 0 & 1 \\ 1 & 2 & 0 \\ 4 & 2 & 1 \end{vmatrix}$ **12.** $\begin{vmatrix} 1 & -1 & 2 \\ 1 & 0 & 2 \\ 0 & -3 & 1 \end{vmatrix}$ **13.** $\begin{vmatrix} 1 & 2 & -1 \\ 2 & 3 & -2 \\ -1 & 4 & 1 \end{vmatrix}$ **14.** $\begin{vmatrix} 2 & -1 & 4 \\ 3 & 0 & 1 \\ -2 & 1 & 4 \end{vmatrix}$

Question 4

Use Cramer's rile to solve each system of the equation

73. $2x - y + 4z + 2 = 0$
$3x + 2y - z + 3 = 0$
$x + 4y + 2z - 17 = 0$

74. $x + y + z - 4 = 0$
$2x - y + 3z - 4 = 0$
$4x + 2y - z + 15 = 0$

Question 5

Find $\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y}$

4. $f(x, y) = 5xy - 7x^2 - y^2 + 3x - 6y + 2$
5. $f(x, y) = (xy - 1)^2$
6. $f(x, y) = (2x - 3y)^3$
7. $f(x, y) = \sqrt{x^2 + y^2}$
8. $f(x, y) = (x^3 + (y/2))^{2/3}$
9. $f(x, y) = 1/(x + y)$
10. $f(x, y) = x/(x^2 + y^2)$
11. $f(x, y) - (x + y)/(xy - 1)$
12. $f(x, y) - \tan^{-1}(y/x)$
13. $f(x, y) = e^{(x+y+1)}$
14. $f(x, y) = e^{-x}\sin(x + y)$
15. $f(x, y) = \ln(x + y)$
16. $f(x, y) = e^{xy}\ln y$
17. $f(x, y) = \sin^2(x - 3y)$
18. $f(x, y) = \cos^2(3x - y^2)$

Question 6

Find the Directional Derivatives

13. $f(x, y, z) = xy + yz + zx, \quad P_0(1, -1, 2), \quad \mathbf{A} = 3\mathbf{i} + 6\mathbf{j} - 2\mathbf{k}$

14. $f(x, y, z) = x^2 + 2y^2 - 3z^2, \quad P_0(1, 1, 1), \quad \mathbf{A} = \mathbf{i} + \mathbf{j} + \mathbf{k}$

15. $g(x, y, z) = 3e^x \cos yz, \quad P_0(0, 0, 0), \quad \mathbf{A} = 2\mathbf{i} + \mathbf{j} - 2\mathbf{k}$

16. $h(x, y, z) = \cos xy + e^{yz} + \ln zx, \quad P_0(1, 0, 1/2), \quad \mathbf{A} = \mathbf{i} + 2\mathbf{j} + 2\mathbf{k}$

17Find out the maxima and minimal of the following function y=(2(x-1)^2)/2x