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Guass Elimination Method:-

Q1

$2x - 3y = -8$

$3x + 4y = 5$

Q2

$x - 3y = 4$

$-2x + 6y = 5$

Q3

$x - 3y = 4$

$-2x + 6y = -8$

Q4

$x - 3y - 2z = 6$

$2x - 4y - 3z = 8$

$-3x + 6y + 8z = -5$

Q5

$x + 2y - 3z = 1$

$2x + 5y - 8z = 4$

$3x + 8y - 13z = 7$

Q6

$x + 2y - 3z = 1$

$x + 3y + 6z = 3$

$2x + 6y + 13z = 5$

Q7

$x + 2y - 3z = 4$

$7x + 3y - 4z = 5$

$8x - 9y + 6z = 1$

Q8

$x + 2y + z = 1$

$2x + 5y - z = -4$

$3x - 2y - z = 5$

Q9

$x + 2y + z = 3$

$2x + 5y - z = -4$

$3x + 2y - z = 5$

Q10

$x + 2y + z = 2$

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

$2x + 3y - z = 9$

Q11

$x_1 + 4x_2 + 2x_3 = 2$

$2x_1 + x_2 - 2x_3 = 9$

$3x_1 + 2x_2 - 2x_3 = 12$

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Q12

$$x_1 + 3x_2 - 2x_3 + 5x_4 = 4$$
$$2x_1 + 8x_2 - x_3 + 9x_4 = 9$$
$$3x_1 + 5x_2 - 12x_3 + 17x_4 = 7$$

Q13

$$x_1 + x_2 - 2x_3 + 4x_4 = 5$$
$$2x_1 + 2x_2 - 3x_3 + x_4 = 3$$
$$3x_1 + 3x_2 - 4x_3 - 2x_4 = 1$$

Q14

$$x_1 + x_2 - 2x_3 + 3x_4 = 4$$
$$2x_1 + 3x_2 + 3x_3 - 8x_4 = 3$$
$$5x_1 + 7x_2 + 4x_3 + x_4 = 5$$

Q15

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

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Echlon / Triangular form :-

Q1

$$2x_1 + 6x_2 + x_3 + 4x_4 - 2x_5 = 7$$
$$x_3 + 2x_4 - 2x_5 = 5$$
$$3x_4 - 9x_5 = 6$$

Q2

$$2x_1 + 3x_2 + 5x_3 - 2x_4 = 9$$
$$5x_2 - x_3 + 3x_4 = 1$$
$$7x_3 - x_4 = 3$$
$$x_4 = 8$$

Q3

$$x_1 + x_2 - 2x_3 + 3x_4 = 4$$
$$7x_3 - 7x_4 = -5$$

Q4

$$x + 2y + z = 3$$
$$y - 3z = -10$$
$$-28y = -84$$

Q5

$$2x_1 + 3x_2 - 6x_3 - 5x_4 + 2x_5 = 7$$
$$x_3 + 3x_4 - 7x_5 = 6$$
$$x_4 - 2x_5 = 1$$

Q6

$$2x - 6y + 7z = 1$$
$$4y + 3z = 8$$
$$2z = 8$$

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Q7

$$x_1 - 3x_2 + 2x_3 - x_4 + 2x_5 = 2$$

$$x_3 + 2x_4 - 3x_5 = 1$$

Q8

Solved the echlon system

$$2x_1 - 3x_2 - 6x_3 - 5x_4 + 2x_5 = 7$$

$$x_3 + 3x_4 - 7x_5 = 6$$

$$x_4 - 2x_5 = 1$$

When $x_2 = a$, $x_5 = b$

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Linear Combination:-
dependent / Independent

Q1

$u = (1,1,0)$, $v = (1,3,2)$, $w = (4,9,5)$

Q2

$u = (1,1,2)$, $v = (2,3,1)$, $w = (4,5,5)$

Q3 $u = (1,2,5)$, $v = (2,5,1)$, $w = (1,5,2)$

Q4 $u = (1,1,5)$, $v = (1,2,3)$, $w = (2,5,4)$

Q5 $(1,1,1)$, $(1,0,1)$

Q6 $(1,2,3)$, $(1,3,5)$, $(1,0,1)$, $(2,3,0)$

Q7 $(1,2,5)$, $(1,3,1)$, $(2,5,7)$, $(3,1,4)$

Q8 $(1,2,3)$, $(1,3,1)$, $(-1,-1,-5)$

Q9

$$\begin{vmatrix} 1 & 3 & 1 & -2 \\ 1 & 4 & 3 & -1 \\ 2 & 3 & -4 & -7 \\ 3 & 8 & 1 & -7 \end{vmatrix}$$

Q10

$$\begin{bmatrix} 1 & -2 & 5 \\ 2 & 3 & 1 \\ 3 & 8 & -3 \end{bmatrix}$$

Q11

$(1,1,1,1)$, $(1,2,3,2)$, $(2,5,6,4)$, $(2,6,8,5)$

~~27 = 8~~

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Q Find Gauss Elimination method?

Q16

$x - 2y + z = -1$

$3x + y - 2z = 4$

$y - z = 1$

Q17

$2x_1 + x_2 + 3x_3 = 3$

$x_1 + x_2 - 2x_3 = 0$

$-3x_1 - x_2 + 2x_3 = -4$

Q18

$x + y = 2$

$2x - z = 1$

$2y - 3z = -1$

Q19

$x_1 - 2x_2 - 2x_3 = -1$

$2x_1 + 3x_2 + x_3 = 1$

$5x_1 - 4x_2 - 3x_3 = 1$

Q20

$x + 2y + z = 2$

$2x + y + z = -1$

$2x + 3y - z = 9$

Q21

$x_1 + 4x_2 + 2x_3 = 2$

$2x_1 + x_2 - 2x_3 = 9$

$3x_1 + 2x_2 - 2x_3 = 12$

LU Decomposition:-

Q1
$$\begin{bmatrix} 1 & 2 & 1 \\ 2 & 3 & 3 \\ -3 & -10 & 2 \end{bmatrix}$$

Q2
$$\begin{bmatrix} 1 & -1 & -1 \\ 3 & -4 & -2 \\ 2 & -3 & -2 \end{bmatrix}$$

Q3
$$\begin{bmatrix} 1 & 3 & -1 \\ 2 & 5 & 1 \\ 3 & 4 & 2 \end{bmatrix}$$

Q4
$$\begin{bmatrix} 3 & 3 & 6 \\ 4 & 7 & 9 \\ 2 & 5 & 4 \end{bmatrix}$$

Q5
$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 7 \\ 3 & 7 & 10 \end{bmatrix}$$

Q6
$$\begin{bmatrix} 1 & 2 & 3 \\ -3 & -4 & 13 \\ 2 & 1 & -5 \end{bmatrix}$$

Q Find inverse of following by row operation,

①
$$\begin{bmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \\ 4 & 1 & 8 \end{bmatrix}$$

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

③
$$\begin{bmatrix} -4 & 1 & -6 \\ 1 & 2 & -5 \\ 6 & 3 & -4 \end{bmatrix}$$

④
$$\begin{bmatrix} 1 & 2 & -4 \\ -1 & -1 & 5 \\ 2 & 7 & -3 \end{bmatrix}$$

⑤
$$\begin{bmatrix} 1 & 4 & -4 \\ 1 & 5 & -1 \\ 3 & 13 & -6 \end{bmatrix}$$

⑥
$$\begin{bmatrix} 1 & 2 & -3 \\ 0 & -2 & 0 \\ -2 & -2 & 2 \end{bmatrix}$$

⑦
$$\begin{bmatrix} 1 & 2 & -1 \\ 0 & -1 & 3 \\ 1 & 0 & 2 \end{bmatrix}$$

⑧
$$\begin{bmatrix} 1 & -3 & 2 \\ 2 & 1 & 0 \\ 0 & -1 & 1 \end{bmatrix}$$

⑨
$$\begin{bmatrix} 2 & 5 & -1 \\ 3 & 4 & 2 \\ 1 & 2 & -2 \end{bmatrix}$$