x_2 ro diagonal bro, absolute the

Gauss Elimination w. Pivoting

① Partial Pivoting

↳ column ma compare garera

↓

diagonal element $\xrightarrow{\text{lai}}$ largest

so,

ⓘ C_1

↳ compare all 3, largest c element vaako row interchange garera R_1 banaune.

& a_{11} ↓ lai 0

ⓘⓘ C_2

↳ a_{12} → out

NOW,

see a_{22} & a_{32} jun ~~tho~~ thulo xa teslai

R_2 ma lagne

&

a_{22} ↓ lai 0

↳ similarly, to make upper Δ matrix

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- **Note :**

yesma elements compare garda

-ve ko → absolute value line

↓

tara row interchange garda

sign ma → no change

1. solve the following system of eqns. using partial pivoting technique

$$2x_1 + 2x_2 + x_3 = 6$$
$$4x_1 + 2x_2 + 3x_3 = 4$$
$$x_1 - x_2 + x_3 = 0$$

soln

$$[A:B] = \left[\begin{array}{ccc:c} 2 & 2 & 1 & 6 \\ 4 & 2 & 3 & 4 \\ 1 & -1 & 1 & 0 \end{array}\right]$$

Interchange

pivot element

pivot eqn

$$= \left[\begin{array}{ccc:c} 4 & 2 & 3 & 4 \\ 2 & 2 & 1 & 6 \\ 1 & -1 & 1 & 0 \end{array}\right]$$

0

4 b : Lions and [illegible]

Applying row :

- $R_2 \rightarrow R_2 - \frac{2}{4} * R_1$

- $R_3 \rightarrow R_3 - \frac{1}{4} * R_1$

$$= \begin{bmatrix} 4 & 2 & 3 & : 4 \\ 0 & 1 & -1/2 & : 4 \\ 0 & -3/2 & 1/4 & : -1 \end{bmatrix}$$

out

interchange

absolute line compare garda

Interchanging R_2 & R_3

$$= \begin{bmatrix} 4 & 2 & 3 & : 4 \\ 0 & -3/2 & 1/4 & : -1 \\ 0 & 1 & -1/2 & : 4 \end{bmatrix}$$

sign change hunna

Applying row operations

- $R_3 \rightarrow R_3 + \frac{2}{3} * R_2$

$$= \begin{bmatrix} 4 & 2 & 3 & : 4 \\ 0 & -3/2 & 1/4 & : -1 \\ 0 & 0 & -1/3 & : 10/3 \end{bmatrix}$$

2nd. 5, 6, -10, 8

Now, by backward substitution

$$\frac{-1}{3} x_3 = \frac{10}{3}$$

$$\therefore x_3 = -10$$

Then,

$$\frac{-3}{2} x_2 + \frac{1}{4}(-10) = -1$$

$$\text{or, } (-3/2)\, x_2 = 3/2$$

$$\therefore x_2 = -1$$

Then,

$$4x_1 + 2(-1) + 3(-10) = 4$$

$$\text{or, } 4x_1 = 36$$

$$\therefore x_1 = 9$$

2. Solve the following system of eq"s using partial pivoting method.

$$2x_1 + x_2 + x_3 - 2x_4 = -10$$
$$4x_1 + 2x_3 + x_4 = 8$$
$$3x_1 + 2x_2 + 2x_3 = 7$$
$$x_1 + 2x_2 + 2x_3 - x_4 = -5$$

① complete pivoting

↳ matrix A bata largest element lai diagonal banaune.

① largest element vako column lai C_1 banaune
↳ column interchange

② Then,
teslai a_{11} banaune at R_1
↳ row interchange
↳ variable interchange hunxa !!
to be noted

③ a_{11} ↓ lai 0

④ R_1 ko elements out

⑤ matrix A ma R_2 & R_3 ko elements compare.

⑥ continue till upper △ matrix