

Q.

1.

2
1
0

$$-1.5a = 0.5$$

$$② - \left[\frac{1}{2} \right] \times ①$$

$$(3) - \left[\frac{1}{2} \right] \times (1)$$

$$③ - \left[-\frac{1}{3} \right]$$

$$z = -1$$

$$2x + 2 - 1 = 3, \quad \boxed{x = 1}$$

$$A =$$

2 1 1 3

$$1 \quad -1 \quad -1 \quad 0$$
$$\begin{pmatrix} 1 & 1 & -3 & 6 \end{pmatrix}$$
$$A =$$

2 1 1 3

$$0 \quad -3/2 \quad -3/2 \quad -3/2$$
$$\begin{matrix} 1 & 1 & -3 & 6 \end{matrix}$$

A =

$$\begin{pmatrix} 2 & 1 & 1 & 3 \\ 0 & -3/2 & -3/2 & -3/2 \\ 0 & 1/2 & -7/2 & 9/2 \end{pmatrix}$$

A =

$$\begin{pmatrix} 2 & 1 & 1 & 3 \\ 0 & -3/2 & -3/2 & -3/2 \\ 0 & 0 & -4 & 4 \end{pmatrix}$$

Ared =

$$\begin{pmatrix} 2 & 1 & 1 \\ 0 & -3/2 & -3/2 \\ 0 & 0 & -4 \end{pmatrix}$$

bred =

$$\begin{pmatrix} 3 \\ -3/2 \\ 4 \end{pmatrix}$$

X =

$$\begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix}$$

2.

A =

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

A =

$$\begin{pmatrix} 1 & -1 & 5 \\ 0 & 3 & 7 \end{pmatrix}$$

$$\begin{pmatrix} 3 & -1 & 2 \end{pmatrix}$$

A =

$$\begin{pmatrix} 1 & -1 & 5 \end{pmatrix}$$

$$\begin{pmatrix} 0 & 3 & 7 \end{pmatrix}$$

$$\begin{pmatrix} 0 & 2 & -13 \end{pmatrix}$$

A =

$$\begin{pmatrix} 1 & -1 & 5 \end{pmatrix}$$

$$\begin{pmatrix} 0 & 3 & 7 \end{pmatrix}$$

$$\begin{pmatrix} 0 & 0 & -53/3 \end{pmatrix}$$

U =

$$\begin{pmatrix} 1 & -1 & 5 \end{pmatrix}$$

$$\begin{pmatrix} 0 & 3 & 7 \end{pmatrix}$$

$$\begin{pmatrix} 0 & 0 & -53/3 \end{pmatrix}$$

L =

$$\begin{pmatrix} 1 & 0 & 0 \end{pmatrix}$$

$$\begin{pmatrix} -1 & 1 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 3 & 2/3 & 1 \end{pmatrix}$$

A =

$$\begin{pmatrix} 1 & -1 & 5 \end{pmatrix}$$

$$\begin{pmatrix} -1 & 4 & 2 \end{pmatrix}$$

$$\begin{pmatrix} 3 & -1 & 2 \end{pmatrix}$$

3

$$\begin{bmatrix} 2 & -3 & -2 & 1 & 0 \\ 0 & 1/2 & 0 & 3/2 & -1 \\ 0 & 0 & 3 & 9 & -3 \\ 0 & 0 & 0 & -6 & 6 \end{bmatrix} \begin{array}{l} 2w - 3 - 4 - 1 = 0, 2w = 8, w = 4 \\ 1/2 x - 3/2 = -1, 1/2 x = 1/2, x = 1 \\ 3y - 9 = -3, 3y = 6, y = 2 \\ z = -1 \end{array} a.$$

$$\begin{bmatrix} 2 & 1 & -2 & 1 & 1 \\ 0 & 5/2 & 0 & 3/2 & -1/2 \\ 0 & 0 & 3 & 9/5 & 12/5 \\ 0 & 0 & 0 & 6/5 & 3/5 \end{bmatrix} \begin{array}{l} 2w + 1/2 - 1 + 1/2 = 1, 2w = 2, w = 1 \\ 5/2 x + 3/4 = -1/2, 5/2 x = -5/4, x = -1/2 \\ 3y + 9/10 = 12/5, 3y = 15/10, y = 1/2 \\ 6/5 z = 3/5, z = 1/2 \end{array} b.$$

4.

Ared =

$$\begin{bmatrix} 2 & 1 & -2 & 1 \\ 0 & 5/2 & 0 & 3/2 \\ 0 & 0 & 3 & 9/5 \\ 0 & 0 & 0 & 6/5 \end{bmatrix}$$

bred =

$$\begin{bmatrix} 1 \\ -1/2 \\ 12/5 \\ 3/5 \end{bmatrix}$$

X =

$$\begin{bmatrix} 1 \\ -1/2 \\ 1/2 \\ 1/2 \end{bmatrix}$$

5.

$$\begin{array}{c}
 \text{A} \qquad \qquad \text{L} \qquad \qquad \text{U} \\
 \textcircled{5} \begin{bmatrix} 1 & 2 & -6 & 9 \\ -2 & -3 & -15 & -18 \\ \frac{1}{2} & 9 & \cancel{7}^{-20} \cancel{21/2} \\ -1 & 0 & 9 & 10 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -2 & 1 & 0 & 0 \\ \frac{1}{2} & 8 & 1 & 0 \\ -1 & \cancel{2} & 3 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 & 2 & 6 & 9 \\ 0 & 1 & \cancel{7}^{-3} & 0 \\ 0 & 0 & 1 & \cancel{7} \text{ row 6} \\ 0 & 0 & 0 & 1 \end{bmatrix}
 \end{array}$$

$$\begin{aligned}
 A_{33} &= -20 & A_{34} &= 21/2 \\
 L_{42} &= 2 \\
 U_{23} &= -3 & U_{34} &= 6
 \end{aligned}$$