

$$\left[ \begin{array}{cccc|c} 1 & -1 & -2 & 2 & -1 \\ -3 & 4 & 7 & -12 & 2 \\ 2 & -4 & -3 & -2 & -12 \\ 5 & -1 & -3 & -31 & -20 \end{array} \right]$$

Diagram showing row operations:

- Row 2: Add 3 times Row 1 to Row 2.
- Row 3: Add -2 times Row 1 to Row 3.
- Row 4: Add -5 times Row 1 to Row 4.

$$\left[ \begin{array}{cccc|c} 1 & -1 & -2 & 2 & -1 \\ 0 & 1 & 1 & -6 & -1 \\ 0 & -2 & 1 & -6 & -10 \\ 0 & 4 & 7 & -41 & -15 \end{array} \right]$$

Diagram showing row operations:

- Row 2: Swap Row 1 and Row 2.
- Row 3: Add 2 times Row 1 to Row 3.
- Row 4: Add -4 times Row 1 to Row 4.

$$\left[ \begin{array}{cccc|c} 1 & -1 & -2 & 2 & -1 \\ 0 & 1 & 1 & -6 & -1 \\ 0 & 0 & 3 & -18 & -12 \\ 0 & 0 & 3 & -17 & -11 \end{array} \right]$$

Diagram showing row operations:

- Row 3: Divide Row 3 by 3.
- Row 4: Subtract Row 3 from Row 4.

$$\left[ \begin{array}{cccc|c} 1 & -1 & -2 & 2 & -1 \\ 0 & 1 & 1 & -6 & -1 \\ 0 & 0 & 1 & -6 & -4 \\ 0 & 0 & 0 & 1 & 1 \end{array} \right]$$

Diagram showing row operations:

- Row 2: Subtract Row 1 from Row 2.
- Row 3: Subtract 6 times Row 1 from Row 3.
- Row 4: Subtract Row 1 from Row 4.

$$\left[ \begin{array}{cccc|c} 1 & -1 & -2 & 0 & -3 \\ 0 & 1 & 1 & 0 & 5 \\ 0 & 0 & 1 & 0 & 2 \\ 0 & 0 & 0 & 1 & 1 \end{array} \right]$$

Diagram showing row operations:

- Row 2: Swap Row 1 and Row 2.
- Row 3: Subtract -1 times Row 1 from Row 3.
- Row 4: Subtract Row 1 from Row 4.

$$\left[ \begin{array}{cccc|c} 1 & -1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 3 \\ 0 & 0 & 1 & 0 & 2 \\ 0 & 0 & 0 & 1 & 1 \end{array} \right]$$

Diagram showing row operations:

- Row 1: Add Row 2 to Row 1.
- Row 3: Subtract Row 2 from Row 3.
- Row 4: Subtract Row 1 from Row 4.

$$\left[ \begin{array}{cccc|c} 1 & 0 & 0 & 0 & 4 \\ 0 & 1 & 0 & 0 & 3 \\ 0 & 0 & 1 & 0 & 2 \\ 0 & 0 & 0 & 1 & 1 \end{array} \right]$$

$x = 4$   
 $y = 3$   
 $z = 2$   
 $w = 1$