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Now, let's continue with the same augmented matrix

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 3 & -15 & -5 & 2 & 27 \\ -2 & 10 & 3 & -4 & -28 \\ 5 & -25 & -2 & -1 & 15 \end{array} \right]$$

$$R_1 = r_1 + r_2$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & -2 & -2 & -1 \\ -2 & 10 & 3 & -4 & -28 \\ 5 & -25 & -2 & -1 & 15 \end{array} \right]$$

$$R_2 = r_2 + 2r_1$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & -2 & -2 & -1 \\ 0 & 0 & -1 & -8 & -30 \\ 5 & -25 & -2 & -1 & 15 \end{array} \right]$$

$$R_3 = r_3 - 5r_1$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & -2 & -2 & -1 \\ 0 & 0 & -1 & -8 & -30 \\ 0 & 0 & 8 & 9 & 20 \end{array} \right]$$

$$R_2 = -r_2$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & -2 & -2 & -1 \\ 0 & 0 & 1 & 8 & 30 \\ 0 & 0 & 8 & 9 & 20 \end{array} \right]$$

$$R_3 = r_3 - 8r_2$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & -2 & -2 & -1 \\ 0 & 0 & 1 & 8 & 30 \\ 0 & 0 & 0 & -55 & -220 \end{array} \right]$$

$$R_3 = -\frac{1}{55}r_3$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & -2 & -2 & -1 \\ 0 & 0 & 1 & 8 & 30 \\ 0 & 0 & 0 & 1 & 4 \end{array} \right]$$

$$R_1 = r_1 + 2r_2$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & 0 & 14 & 59 \\ 0 & 0 & 1 & 8 & 30 \\ 0 & 0 & 0 & 1 & 4 \end{array} \right]$$

$$R_2 = r_2 - 8r_3$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & 0 & 14 & 59 \\ 0 & 0 & 1 & 0 & -2 \\ 0 & 0 & 0 & 1 & 4 \end{array} \right]$$

$$R_1 = r_3 - 14r_3$$

$$[A|\vec{b}] = \left[\begin{array}{cccc|c} 1 & -5 & 0 & 0 & 3 \\ 0 & 0 & 1 & 0 & -2 \\ 0 & 0 & 0 & 1 & 4 \end{array} \right]$$

Reduced Row Echelon Form: $[A \vec{b}] = \left[\begin{array}{cccc c} 1 & -5 & 0 & 0 & 3 \\ 0 & 0 & 1 & 0 & -2 \\ 0 & 0 & 0 & 1 & 4 \end{array} \right]$
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