$$
\begin{pmatrix} 1 & 6 & 1 & -4 \\ 0 & -4 & -1 & 3 \\ -1 & 1 & 1 & -1 \\ 0 & 2 & 0 & -1 \end{pmatrix} \cdot \begin{pmatrix} 4 & 2 & 4 & 6 \\ 6 & 3 & 6 & 9 \\ 6 & 3 & 6 & 9 \\ 2 & 1 & 2 & 3 \end{pmatrix} = \begin{pmatrix} 38 & 19 & 38 & 57 \\ -24 & -12 & -24 & -36 \\ 6 & 3 & 6 & 9 \\ 10 & 5 & 10 & 15 \end{pmatrix}
$$

$$
\begin{pmatrix} 1 & 6 & 1 & -4 \\ 0 & -4 & -1 & 3 \\ -1 & 1 & 1 & -1 \\ 0 & 2 & 0 & -1 \end{pmatrix} \cdot -4 = \begin{pmatrix} -4 & -24 & -4 & 16 \\ 0 & 16 & 4 & -12 \\ 4 & -4 & -4 & 4 \\ 0 & -8 & 0 & 4 \end{pmatrix}
$$

$$
\begin{pmatrix} 1 & 6 & 1 & -4 \\ 0 & -4 & -1 & 3 \\ -1 & 1 & 1 & -1 \\ 0 & 2 & 0 & -1 \end{pmatrix} + \begin{pmatrix} 4 & 2 & 4 & 6 \\ 6 & 3 & 6 & 9 \\ 6 & 3 & 6 & 9 \\ 2 & 1 & 2 & 3 \end{pmatrix} = \begin{pmatrix} 5 & 8 & 5 & 2 \\ 6 & -1 & 5 & 12 \\ 5 & 4 & 7 & 8 \\ 2 & 3 & 2 & 2 \end{pmatrix}
$$

$$
\left( \begin{array}{cccc|cccc} 1 & 6 & 1 & -4 & 1 & 0 & 0 & 0 \\ 0 & -4 & -1 & 3 & 0 & 1 & 0 & 0 \\ -1 & 1 & 1 & -1 & 0 & 0 & 1 & 0 \\ 0 & 2 & 0 & -1 & 0 & 0 & 0 & 1 \end{array} \right)
$$

$$
= \begin{array}{c} W_1 \\ W_2 \\ W_3 + W_1 \\ W_4 \end{array} \left( \begin{array}{cccc|cccc} 1 & 6 & 1 & -4 & 1 & 0 & 0 & 0 \\ 0 & -4 & -1 & 3 & 0 & 1 & 0 & 0 \\ 0 & 7 & 2 & -5 & 1 & 0 & 1 & 0 \\ 0 & 2 & 0 & -1 & 0 & 0 & 0 & 1 \end{array} \right)
$$

$$
= \begin{array}{c} W_1 - 3W_4 \\ ^1\!/_2 W_4 \\ W_3 + {}^{-7}\!/_2 W_4 \\ 2W_4 + W_2 \end{array} \left( \begin{array}{cccc|cccc} 1 & 0 & 1 & -1 & 1 & 0 & 0 & -3 \\ 0 & 1 & 0 & -^1\!/_2 & 0 & 0 & 0 & ^1\!/_2 \\ 0 & 0 & 2 & -^3\!/_2 & 1 & 0 & 1 & -^7\!/_2 \\ 0 & 0 & -1 & 1 & 0 & 1 & 0 & 2 \end{array} \right)
$$

$$
= \begin{array}{c} W_1 + W_4 \\ W_2 \\ -W_4 \\ 2W_4 + W_3 \end{array} \left( \begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 1 & 0 & -1 \\ 0 & 1 & 0 & -^1\!/_2 & 0 & 0 & 0 & ^1\!/_2 \\ 0 & 0 & 1 & -1 & 0 & -1 & 0 & -2 \\ 0 & 0 & 0 & ^1\!/_2 & 1 & 2 & 1 & ^1\!/_2 \end{array} \right)
$$

$$
= \begin{array}{c} W_1 \\ W_2 + W_4 \\ 2W_4 + W_3 \\ 2W_4 \end{array} \left( \begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 1 & 0 & -1 \\ 0 & 1 & 0 & 0 & 1 & 2 & 1 & 1 \\ 0 & 0 & 1 & 0 & 2 & 3 & 2 & -1 \\ 0 & 0 & 0 & 1 & 2 & 4 & 2 & 1 \end{array} \right)
$$

1

$$\left(\begin{array}{cccc|cccc} 1 & 6 & 1 & -4 & 1 & 0 & 0 & 0 \\ 0 & -4 & -1 & 3 & 0 & 1 & 0 & 0 \\ -1 & 1 & 1 & -1 & 0 & 0 & 1 & 0 \\ 0 & 2 & 0 & -1 & 0 & 0 & 0 & 1 \end{array}\right)$$

$$=\begin{array}{c} W_1 \\ W_2 \\ W_3 + W_1 \\ W_4 \end{array} \left(\begin{array}{cccc|cccc} 1 & 6 & 1 & -4 & 1 & 0 & 0 & 0 \\ 0 & -4 & -1 & 3 & 0 & 1 & 0 & 0 \\ 0 & 7 & 2 & -5 & 1 & 0 & 1 & 0 \\ 0 & 2 & 0 & -1 & 0 & 0 & 0 & 1 \end{array}\right)$$

$$=\begin{array}{c} W_1 - 3W_4 \\ {}^1\!/_2 W_4 \\ W_3 + {}^{-7}\!/_2 W_4 \\ 2W_4 + W_2 \end{array} \left(\begin{array}{cccc|cccc} 1 & 0 & 1 & -1 & 1 & 0 & 0 & -3 \\ 0 & 1 & 0 & -{}^1\!/_2 & 0 & 0 & 0 & {}^1\!/_2 \\ 0 & 0 & 2 & -{}^3\!/_2 & 1 & 0 & 1 & -{}^7\!/_2 \\ 0 & 0 & -1 & 1 & 0 & 1 & 0 & 2 \end{array}\right)$$

$$=\begin{array}{c} W_1 + W_4 \\ W_2 \\ -W_4 \\ 2W_4 + W_3 \end{array} \left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 1 & 0 & -1 \\ 0 & 1 & 0 & -{}^1\!/_2 & 0 & 0 & 0 & {}^1\!/_2 \\ 0 & 0 & 1 & -1 & 0 & -1 & 0 & -2 \\ 0 & 0 & 0 & {}^1\!/_2 & 1 & 2 & 1 & {}^1\!/_2 \end{array}\right)$$

$$=\begin{array}{c} W_1 \\ W_2 + W_4 \\ 2W_4 + W_3 \\ 2W_4 \end{array} \left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 1 & 0 & -1 \\ 0 & 1 & 0 & 0 & 1 & 2 & 1 & 1 \\ 0 & 0 & 1 & 0 & 2 & 3 & 2 & -1 \\ 0 & 0 & 0 & 1 & 2 & 4 & 2 & 1 \end{array}\right)$$

$$\left(\begin{array}{cccc} 1 & 6 & 1 & -4 \\ 0 & -4 & -1 & 3 \\ -1 & 1 & 1 & -1 \\ 0 & 2 & 0 & -1 \end{array}\right) \cdot \left(\begin{array}{cccc} -1 & -1 & 0 & 1 \\ -1 & -2 & -1 & -1 \\ -2 & -3 & -2 & 1 \\ -2 & -4 & -2 & -1 \end{array}\right) = \left(\begin{array}{cccc} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{array}\right)$$

$$
\left(\begin{array}{cccc|cccc}
1 & 6 & 1 & -4 & 4 & 2 & 4 & 6 \\
0 & -4 & -1 & 3 & 6 & 3 & 6 & 9 \\
-1 & 1 & 1 & -1 & 6 & 3 & 6 & 9 \\
0 & 2 & 0 & -1 & 2 & 1 & 2 & 3
\end{array}\right)
$$

$$
=
\begin{array}{c}
W_1 \\
W_2 \\
W_3 + W_1 \\
W_4
\end{array}
\left(\begin{array}{cccc|cccc}
1 & 6 & 1 & -4 & 4 & 2 & 4 & 6 \\
0 & -4 & -1 & 3 & 6 & 3 & 6 & 9 \\
0 & 7 & 2 & -5 & 10 & 5 & 10 & 15 \\
0 & 2 & 0 & -1 & 2 & 1 & 2 & 3
\end{array}\right)
$$

$$
=
\begin{array}{c}
W_1 - 3W_4 \\
\tfrac{1}{2}W_4 \\
W_3 + \, ^{-7}/_2 W_4 \\
2W_4 + W_2
\end{array}
\left(\begin{array}{cccc|cccc}
1 & 0 & 1 & -1 & -2 & -1 & -2 & -3 \\
0 & 1 & 0 & -^1/_2 & 1 & ^1/_2 & 1 & ^3/_2 \\
0 & 0 & 2 & -^3/_2 & 3 & ^3/_2 & 3 & ^9/_2 \\
0 & 0 & -1 & 1 & 10 & 5 & 10 & 15
\end{array}\right)
$$

$$
=
\begin{array}{c}
W_1 + W_4 \\
W_2 \\
-W_4 \\
2W_4 + W_3
\end{array}
\left(\begin{array}{cccc|cccc}
1 & 0 & 0 & 0 & 8 & 4 & 8 & 12 \\
0 & 1 & 0 & -^1/_2 & 1 & ^1/_2 & 1 & ^3/_2 \\
0 & 0 & 1 & -1 & -10 & -5 & -10 & -15 \\
0 & 0 & 0 & ^1/_2 & 23 & ^{23}/_2 & 23 & ^{69}/_2
\end{array}\right)
$$

$$
=
\begin{array}{c}
W_1 \\
W_2 + W_4 \\
2W_4 + W_3 \\
2W_4
\end{array}
\left(\begin{array}{cccc|cccc}
1 & 0 & 0 & 0 & 8 & 4 & 8 & 12 \\
0 & 1 & 0 & 0 & 24 & 12 & 24 & 36 \\
0 & 0 & 1 & 0 & 36 & 18 & 36 & 54 \\
0 & 0 & 0 & 1 & 46 & 23 & 46 & 69
\end{array}\right)
$$