The dimension is 2.

So, they are linearly independent.

\[ \begin{pmatrix} 0 & 1 & -2 \\ 2 & 4 & -4 \end{pmatrix} \]

\[ \begin{pmatrix} 5 & 2 & 4 \\ 2 & 4 & 6 \end{pmatrix} \]

Because there exists a non-trivial linear combination of the vectors that equals 0:

\[ x_1 + 2x_2 + 4x_3 = 0 \]

\[ 5x_1 + 2x_2 + 4x_3 = 0 \]

Therefore, they are linearly independent.

Use Gaussian Elimination method to solve the given system of show that no solution exists:

\[ \begin{align*}
&x_1 - 6x_2 + 3x_3 = 0 \\
&-2x_1 + x_2 - 2x_3 = 0 \\
&-x_1 + 2x_2 + x_3 = 0 \\
\end{align*} \]