For A to be invertible, its columns must be linearly independent. To check this, consider the following equation

$$A\vec{x} = \vec{0}$$
$$\vec{v}_1 x_1 + \vec{v}_2 x_2 + \ldots + \vec{v}_n x_n = \vec{0}$$

Let $i = 1$ and $j = 2$ so that the first two columns of A are equal. Then, the equation becomes

$$\vec{v}_1(x_1 + x_2) + \ldots + \vec{v}_n x_n = \vec{0}$$

Notice that to get $\vec{0}$ as a solution, any constant such that $x_1 = -x_2$ will cancel out the first term. Then, the rest of $\vec{x}$ can be zeros. Since there is an infinite number of solutions rather than only the trivial $\vec{x} = \vec{0}$, the columns of A are linearly dependent. Therefore, A is not invertible.