Find the inverse of matrix $A\begin{bmatrix}1 & 3 & 3\\ 1 & 4 & 3\\ 1 & 3 & 4\end{bmatrix}$:

$$|A| = \begin{vmatrix}1 & 3 & 3\\ 1 & 4 & 3\\ 1 & 3 & 4\end{vmatrix} \quad R_3 \to R_3 - R_1$$

$$|A| = \begin{vmatrix}1 & 3 & 3\\ 1 & 4 & 3\\ 0 & 0 & 1\end{vmatrix} \Rightarrow |A| = 1$$

$$A = \begin{bmatrix}1 & 3 & 3\\ 1 & 4 & 3\\ 1 & 3 & 4\end{bmatrix} \begin{cases} C_{11} = 7;\ C_{12} = -1;\ C_{13} = -1;\ C_{21} = -3;\ C_{22} = 1;\ C_{23} = 0; \\ \\ C_{31} = -3;\ C_{32} = 0;\ C_{33} = 1 \end{cases}$$

$$C = \begin{pmatrix}7 & -1 & -1\\ -3 & 1 & 0\\ -3 & 0 & 1\end{pmatrix};\ adj(A) = \begin{pmatrix}7 & -3 & -3\\ -1 & 1 & 0\\ -1 & 0 & 1\end{pmatrix}$$

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