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$$(A + u\bar{v}^T)^{-1} = K$$

$$\begin{array}{l} \bar{V} \rightarrow m \times 1 \quad u\bar{v}^T \rightarrow n \times m \Rightarrow A \rightarrow n \times n \\ u \rightarrow n \times 1 \quad \bar{v}^T \rightarrow 1 \times m \\ A^T \rightarrow m \times n \end{array}$$

$$(A + u\bar{v}^T)K = I_n \xrightarrow{A^{-1} \times} (\bar{I}_m + A^{-1}u\bar{v}^T)K = A^{-1}$$

$$\bar{v}^T \times (\bar{v}^T + \underbrace{\bar{v}^T A^{-1} u \bar{v}^T}_{\text{ماتریس } 1 \times 1 \text{ عدد ثابت}})K = \bar{v}^T A^{-1}$$

$$\underbrace{(1 + \bar{v}^T A^{-1} u)}_{\text{ضریب عددی}} \bar{v}^T K = \bar{v}^T A^{-1} \rightarrow \bar{v}^T K = \frac{\bar{v}^T A^{-1}}{1 + \bar{v}^T A^{-1} u}$$

$$\xrightarrow{u \times} u\bar{v}^T K = \frac{u\bar{v}^T A^{-1}}{1 + \bar{v}^T A^{-1} u} \xrightarrow{+AK} AK + u\bar{v}^T K = AK + \frac{u\bar{v}^T A^{-1}}{1 + \bar{v}^T A^{-1} u}$$

$$\bar{v}^T \times A^{-1} \rightarrow 1 \times n$$

$$\bar{v}^T \times A^{-1} \times u \rightarrow 1 \times 1$$

$$\rightarrow \underbrace{(A + u\bar{v}^T)}_{K^{-1}} K = AK + \frac{u\bar{v}^T A^{-1}}{1 + \bar{v}^T A^{-1} u} = I \xrightarrow{A^{-1} \times} K + \frac{A^{-1} u \bar{v}^T A^{-1}}{1 + \bar{v}^T A^{-1} u} = A^{-1}$$

$$\rightarrow K = A^{-1} - \frac{A^{-1} u \bar{v}^T A^{-1}}{1 + \bar{v}^T A^{-1} u}$$