$$= \begin{pmatrix} b_{11} X_{11} + b_{12} X_{21} & b_{21} X_{11} + b_{22} X_{21} \\ \\ b_{11} X_{12} + b_{12} X_{22} & b_{21} X_{12} + b_{22} X_{22} \end{pmatrix}$$

$$+$$

$$\begin{pmatrix} b_{11} X_{11} + b_{21} X_{12} & b_{11} X_{21} + b_{21} X_{22} \\ \\ b_{12} X_{11} + b_{22} X_{12} & b_{12} X_{21} + b_{22} X_{22} \end{pmatrix}$$

$$= \begin{pmatrix} X_{11} & X_{21} \\ X_{12} & X_{22} \end{pmatrix} \begin{pmatrix} b_{11} & b_{21} \\ b_{12} & b_{22} \end{pmatrix} + \begin{pmatrix} b_{11} & b_{21} \\ b_{12} & b_{22} \end{pmatrix} \begin{pmatrix} X_{11} & X_{21} \\ X_{12} & X_{22} \end{pmatrix}$$

$$\boxed{= X^T B^T + B^T X^T}$$