

Matrices

Consider the following matrices:

$$A = \begin{pmatrix} 10 & -2 \\ 2 & 4 \end{pmatrix} \quad (1)$$

$$B = \begin{pmatrix} 2 & 3 \\ 2 & 1 \end{pmatrix} \quad (2)$$

$$C = \begin{pmatrix} 2 & 2 \\ 3 & 1 \end{pmatrix} \quad (3)$$

$$X = \begin{pmatrix} 1 \\ 4 \end{pmatrix} \quad (4)$$

Calculate the following quantities:

1. $A^T B^T$
2. $B^T A^T$
3. $(AB)^T$
4. $\text{Tr}A$
5. $\text{Tr}A + \text{Tr}B$
6. $\text{Tr}(A + B)$
7. $\text{Tr}(A^T)$