

STAT230 Homework 2

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1 Problem B.6

$$A^2 = \begin{bmatrix} 11 & 8 \\ 20 & 19 \end{bmatrix} \quad (1)$$

2 Problem B.7

Impossible because C is not a square matrix.

3 Problem C.4

Without loss of generality, let assume $E[U] = 0$.

$$\text{cov}(AU) = E[AU(AU)^T] \quad (2)$$

$$= E[AUU^T A^T] \quad (3)$$

$$= AE[UU^T] A^T \quad (4)$$

$$= A\text{cov}(U)A^T \quad (5)$$

4 Problem D.5

Since \sqrt{D} is diagonal, $\sqrt{D}\sqrt{D}$ is also diagonal whose i th diagonal element is equal to $\sqrt{D_{ii}} * \sqrt{D_{ii}} = D_{ii}$. Therefore, $D = \sqrt{D}\sqrt{D}$.