0.5 von 0.5 Punkten

Assume that $c = c_1 = c_2 \in \mathbb{R}\backslash\{0\}$. Determine the value for $c \in \mathbb{R}\backslash\{0\}$ such that $\boldsymbol{AX}$ and $\boldsymbol{CX}$ are independent.

NA ✓

1 von 1 Punkt

Assume that $c_1 = c$ and $c_2 = c^2 - 2$ for some $c \in \mathbb{R}$. Determine the values for $c \in \mathbb{R}$ such that $\boldsymbol{X'AX}$ and $\boldsymbol{CX}$ are independent.

-2 & 1 ✓

1 von 1 Punkt

Assume that $c_1 = c$ and $c_2 = c^2 - 2$ for some $c \in \mathbb{R}$. Determine the values for $c \in \mathbb{R}$ such that $\boldsymbol{X'AX}$ and $\boldsymbol{X'CX}$ are independent.

1 ✓

0.5 Punkte

Assume that $\boldsymbol{\mu} = \mathbf{0} \in \mathbb{R}^2$. Find the value for $a \in \mathbb{R}\backslash\{0\}$ such that $a \cdot \boldsymbol{X'AX} \sim \chi^2(2)$, where $\chi^2(d)$ denotes the χ^2-distribution with $d \in \mathbb{N}$ degrees of freedom.

1 ✗ NA

1 Punkt

Assume that $\boldsymbol{\mu} = \mathbf{0} \in \mathbb{R}^2$. Find the value for $a \in \mathbb{R}\backslash\{0\}$ such that $a \cdot \boldsymbol{X'AX} \sim \chi^2(1)$.

0 ✗ 0.25

← Vorherige Aufgabe
Nächste Aufgabe →

Nachkorrekturantrag anlegen?

Vorherige Aufgabe
Nächste Aufgabe

Let $\boldsymbol{X} \sim N_2(\boldsymbol{\mu}, I_2)$ for some $\boldsymbol{\mu} \in \mathbb{R}^2$. Furthermore, define the matrices $A, B, C \in \mathbb{R}^{2\times 2}$ by

$$A = \begin{pmatrix} 2 & 2 \\ 2 & 2 \end{pmatrix}, \quad B = \begin{pmatrix} 1 & b \\ b & 1 \end{pmatrix}, \quad C = \begin{pmatrix} c_1 & c_2 \\ -1 & 1 \end{pmatrix}.$$

Give your answers to the tasks below by filling in the blanks. Results that are numerical values should, if necessary, be rounded to two decimals. In case of multiple solutions, please order your solutions from smallest to largest and separate them by " & " (without quotations marks but with spaces, e.g.: 3 & 5). If such a value **does not exist**, then type "NA" (without quotation marks) instead into the blank. If the value can be **chosen arbitrarily**, then type "R" (without quotation marks) instead into the blank.

3.5 von 5.5 Punkten

Determine the value for $b \in \mathbb{R}$ such that $A\boldsymbol{X}$ and $B\boldsymbol{X}$ are independent.

1 von 1 Punkt

-1 ✓

Assume that $c = c_1 = -c_2 \in \mathbb{R}$. Determine the value for $c \in \mathbb{R}$ such that $A\boldsymbol{X}$ and $C\boldsymbol{X}$ are independent.

0.5 Punkte

1 ✗ R

Assume that $c = c_1 = c_2 \in \mathbb{R}\backslash\{0\}$. Determine the value for $c \in \mathbb{R}\backslash\{0\}$ such that $A\boldsymbol{X}$ and $C\boldsymbol{X}$ are independent.

0.5 von 0.5 Punkten

NA ✓