E2.3.4 Questions 7-8

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Exam 2 due Dec 3, 2023 04:42 IST Completed

E2.3.4 Questions 7-8

Question 7

10.0/10.0 points (graded)

Let A and B be invertible. Then

$$\begin{pmatrix} A & 0 \\ 0 & B \end{pmatrix}^{-1} = \begin{pmatrix} A^{-1} & 0 \\ 0 & B^{-1} \end{pmatrix}$$

Always ✔ Answer: Always

(Justify your answer)

Let A and B be invertible. Then

$$\begin{pmatrix} A & 0 \\ 0 & B \end{pmatrix}^{-1} = \begin{pmatrix} A^{-1} & 0 \\ 0 & B^{-1} \end{pmatrix}$$

Always/Sometimes/Never

(Justify your answer)

Answer: Always

$$\begin{pmatrix} A & 0 \\ 0 & B \end{pmatrix}\begin{pmatrix} A^{-1} & 0 \\ 0 & B^{-1} \end{pmatrix} = \begin{pmatrix} AA^{-1} & 0 \\ 0 & BB^{-1} \end{pmatrix} = \begin{pmatrix} I & 0 \\ 0 & I \end{pmatrix} = I.$$

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Answers are displayed within the problem

Question 8

10.0/10.0 points (graded)

Evaluate

$$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}^{-1} \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -2 & 0 & 1 \end{pmatrix} \begin{pmatrix} 0 & 1 & 0 \\ 1 & -1 & 0 \\ 0 & 2 & 1 \end{pmatrix} \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} 1/2 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1/3 \end{pmatrix}^{-1} =$$

0	✔ Answer: 0	1	✔ Answer: 1	0	✔ Answer: 0
2	✔ Answer: 2	0	✔ Answer: 0	0	✔ Ans

Calculator

0	✔ Answer: 0	0	✔ Answer: 0	-3	✔ Answer: -3

Answer:

$$\underbrace{\underbrace{\begin{pmatrix}0&1&0\\1&0&0\\0&0&1\end{pmatrix}^{-1}}_{\begin{pmatrix}0&1&0\\1&0&0\\0&0&1\end{pmatrix}}\begin{pmatrix}1&0&0\\1&1&0\\-2&0&1\end{pmatrix}\underbrace{\begin{pmatrix}0&1&0\\1&-1&0\\0&2&1\end{pmatrix}\begin{pmatrix}0&1&0\\1&0&0\\0&0&1\end{pmatrix}}_{\begin{pmatrix}1&0&0\\-1&1&0\\2&0&1\end{pmatrix}}\underbrace{\begin{pmatrix}\frac{1}{2}&0&0\\0&1&0\\0&0&-\frac{1}{3}\end{pmatrix}^{-1}}_{\begin{pmatrix}2&0&0\\0&1&0\\0&0&-3\end{pmatrix}}}_{I}}_{\begin{pmatrix}0&1&0\\2&0&0\\0&0&-3\end{pmatrix}}$$

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Answers are displayed within the problem

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