

Help 🗘

sandipan_dey ~

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E1.3.2 Exam Question 2

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Exam 1 due Oct 31, 2023 09:12 IST Completed

Question 2

6/6 points (graded)

Determine the matrix $oldsymbol{A}$ so that

$$Aegin{pmatrix} 0 \ 1 \end{pmatrix} = egin{pmatrix} 1 \ 2 \ -1 \end{pmatrix} \quad ext{and} \quad Aegin{pmatrix} -1 \ 1 \end{pmatrix} = egin{pmatrix} 1 \ 3 \ 0 \end{pmatrix}.$$

✓ Answer: 0

1

Answer: 1

$$A =$$
 -1

✓ Answer: -1

2

✓ Answer: 2

-1

✓ Answer: -1

-1

✓ Answer: -1

Answer:
$$A \begin{pmatrix} 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix}$$
 so we know that the second column of A equals $\begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix}$.

Now, we want to figure out what $A\begin{pmatrix} 1\\0 \end{pmatrix}$ equals. We notice that

$$\left(\begin{array}{c} 1\\0 \end{array}\right) = \left(\begin{array}{c} 0\\1 \end{array}\right) - \left(\begin{array}{c} -1\\1 \end{array}\right).$$

Thus

$$A(\left(\begin{array}{c}1\\0\end{array}\right))=A(\left(\begin{array}{c}0\\1\end{array}\right)-\left(\begin{array}{c}-1\\1\end{array}\right))=A\left(\begin{array}{c}0\\1\end{array}\right)-A\left(\begin{array}{c}-1\\1\end{array}\right)=\left(\begin{array}{c}1\\2\\-1\end{array}\right)-\left(\begin{array}{c}1\\3\\0\end{array}\right)=\left(\begin{array}{c}0\\-1\\-1\end{array}\right).$$

Thus,

$$A = \left(\begin{array}{cc} 0 & 1 \\ -1 & 2 \end{array} \right).$$

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