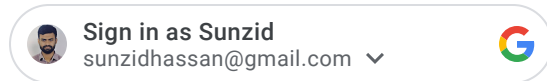




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## Exercise 35, Linear Algebra: A Modern Introduction, 4th Edition

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Linear Algebra: A Modern Introduction, 4th Edition, Chapter 6: Vector Spaces

### Exercise 35, Page 514

## Exercise 35 Answer

### Step by step explanation

HIDE ALL

#### Tip



- In this question, we will find eigenvalue.

#### Explanation



- We will take  $\beta$  as the standard basis.

- As  $[T]_{\beta}$  is diagonalizable. We take  $\beta = \mathcal{C}$  and  $[T]_{\beta} = [T]_{\mathcal{C}}$

### Step 1 of 1

Let,  $\beta = \{1, x\}$  be the standard basis of  $P_1$

Then,

$$T(1) = 1$$

$$T(x) = 2x$$

Thus,

$$[T]_{\beta} = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$$

Since,  $[T]_{\beta}$  is diagonalizable.

$\mathcal{C} = \beta = \{1, x\}$  is the basis of  $P_1$  such that  $[T]_{\mathcal{C}}$  is a diagonal matrix.

Therefore,  $T$  is diagonalizable.

### ◆ Final Answer

$$\mathcal{C} = \{1, x\}$$

$$[T]_{\mathcal{C}} = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$$

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