1.4.5 Vector Functions

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Week 1 due Oct 5, 2023 03:12 IST Completed

1.4.5 Vector Functions

Video

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Dr. Robert van de Geijn: Next week we're going to talk about a special

kind of function called a linear transformation.

In order to understand what the linear transformation is, you first need to

understand what a vector function is, which is what we're going

0:00 / 0:00 2.0x

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Reading Assignment

0 points possible (ungraded)

Read Unit 1.4.5 of the notes. [LINK]

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? Scaler or Constant?

We used scaler initially to scale vectors and that seemed to do justice with the word. But now in this unit we are using numbers say, to add som... 2

Homework 1.4.5.1

Calculator

8/8 points (graded)

If $f(\alpha, \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix}) = \begin{pmatrix}\chi_0+\alpha\\ \chi_1+\alpha\\ \chi_2+\alpha\end{pmatrix}$, find

- $f(1, \begin{pmatrix}6\\ 2\\ 3\end{pmatrix}) = \begin{pmatrix}7\\ 3\\ 4\end{pmatrix}$

  TRUE ✔ Answer: TRUE

- $f(\alpha, \begin{pmatrix}0\\ 0\\ 0\end{pmatrix}) = \begin{pmatrix}\alpha\\ \alpha\\ \alpha\end{pmatrix}$

  TRUE ✔ Answer: TRUE

- $f(0, \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix}) = \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix}$

  TRUE ✔ Answer: TRUE

- $f(\beta, \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix}) = \begin{pmatrix}\beta\chi_0\\ \beta\chi_1\\ \beta\chi_2\end{pmatrix}$

  FALSE ✔ Answer: FALSE

- $\alpha f(\beta, \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix}) = \begin{pmatrix}\alpha\chi_0+\beta\\ \alpha\chi_1+\beta\\ \alpha\chi_2+\beta\end{pmatrix}$

  FALSE ✔ Answer: FALSE

- $f(\beta, \alpha \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix}) = \begin{pmatrix}\alpha\chi_0+\beta\\ \alpha\chi_1+\beta\\ \alpha\chi_2+\beta\end{pmatrix}$

  TRUE ✔ Answer: TRUE

- $f(\alpha, \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix} + \begin{pmatrix}\psi_0\\ \psi_1\\ \psi_2\end{pmatrix}) = \begin{pmatrix}\chi_0+\psi_0+\alpha\\ \chi_1+\psi_1+\alpha\\ \chi_2+\psi_2+\alpha\end{pmatrix}$

  TRUE ✔ Answer: TRUE

- $f(\alpha, \begin{pmatrix}\chi_0\\ \chi_1\\ \chi_2\end{pmatrix}) + f(\alpha, \begin{pmatrix}\psi_0\\ \psi_1\\ \psi_2\end{pmatrix}) = \begin{pmatrix}\chi_0+\psi_0+\alpha\\ \chi_1+\psi_1+\alpha\\ \chi_2+\psi_2+\alpha\end{pmatrix}$

  FALSE ✔ Answer: FALSE

Press "Show Answer(s)" for correct expressions

$$f(1, \begin{pmatrix}6\\ 2\\ 3\end{pmatrix}) = \begin{pmatrix}7\\ 3\\ 4\end{pmatrix}$$

$$f(\alpha, \begin{pmatrix}0\\ 0\end{pmatrix}) = \begin{pmatrix}\alpha\\ \alpha\end{pmatrix}$$

Calculator

$$f(\alpha, \begin{pmatrix} 0 \\ 0 \end{pmatrix}) = \begin{pmatrix} \alpha \\ \alpha \end{pmatrix}$$

$$f(0, \begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix}) = \begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix}$$

$$f(\beta, \begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix}) = \begin{pmatrix} \chi_0 + \beta \\ \chi_1 + \beta \\ \chi_2 + \beta \end{pmatrix}$$

$$\alpha f(\beta, \begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix}) = \begin{pmatrix} \alpha\chi_0 + \alpha\beta \\ \alpha\chi_1 + \alpha\beta \\ \alpha\chi_2 + \alpha\beta \end{pmatrix}$$

$$f(\beta, \alpha \begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix}) = \begin{pmatrix} \alpha\chi_0 + \beta \\ \alpha\chi_1 + \beta \\ \alpha\chi_2 + \beta \end{pmatrix}$$

$$f(\alpha, \begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix} + \begin{pmatrix} \psi_0 \\ \psi_1 \\ \psi_2 \end{pmatrix}) = \begin{pmatrix} \chi_0 + \psi_0 + \alpha \\ \chi_1 + \psi_1 + \alpha \\ \chi_2 + \psi_2 + \alpha \end{pmatrix}$$

$$f(\alpha, \begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix}) + f(\alpha, \begin{pmatrix} \psi_0 \\ \psi_1 \\ \psi_2 \end{pmatrix}) = \begin{pmatrix} \chi_0 + \psi_0 + 2\alpha \\ \chi_1 + \psi_1 + 2\alpha \\ \chi_2 + \psi_2 + 2\alpha \end{pmatrix}$$

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