

Linear Algebra Different Perspectives

Concept: in this worksheet, we will study the same problem using different fields of mathematics to show how they are connected

The Problem

$$\text{Is } \vec{v} = \begin{bmatrix} 7 \\ 4 \end{bmatrix} \text{ a linear combination of } \vec{a} = \begin{bmatrix} 3 \\ 1 \end{bmatrix} \text{ and } \vec{b} = \begin{bmatrix} 1 \\ 2 \end{bmatrix} ?$$

(1) Algebra perspective

Write the system of equations that corresponds to the original problem and solve it using elimination or substitution.

(2) Geometry perspective

Sketch the vectors and find an approximate solution to this problem

(3) Matrices perspective

Write the augmented matrix of the system and solve with Gauss-Jordan elimination

(4) Functions perspective

Sketch the lines that correspond to the system of equations and evaluate the intersection of these lines