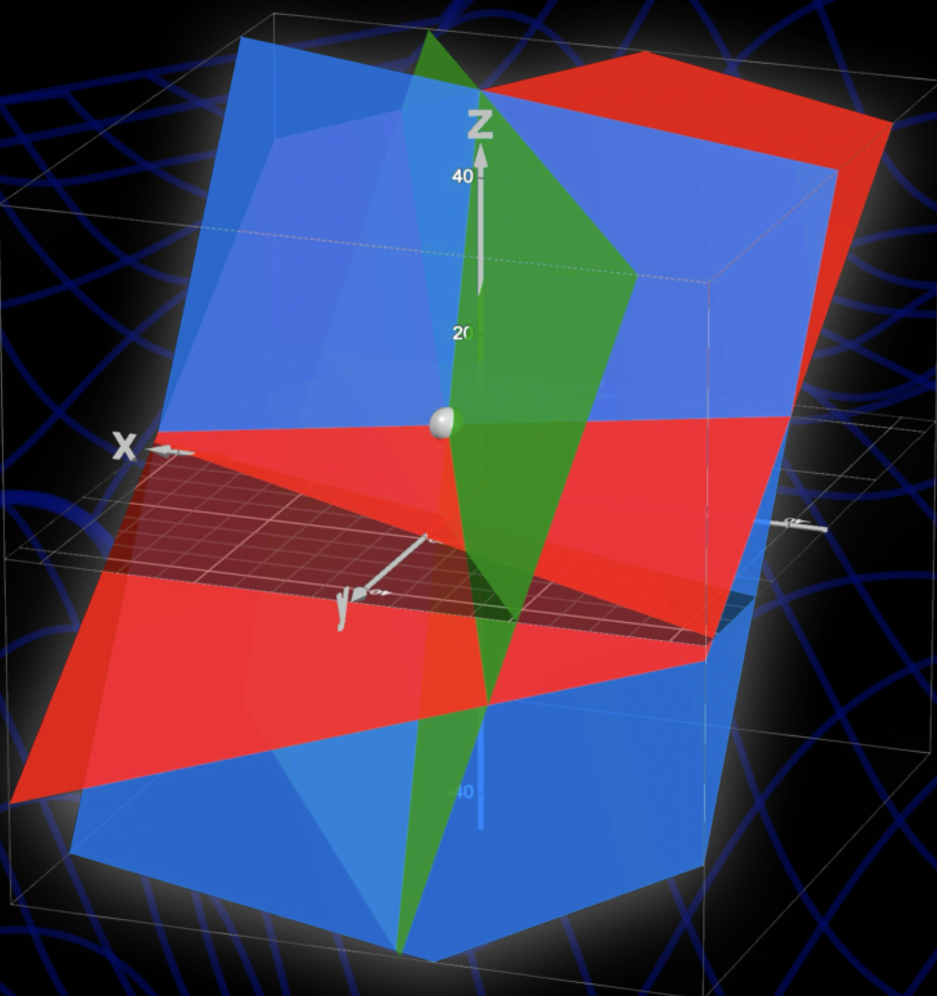
The Language of
Linear Algebra



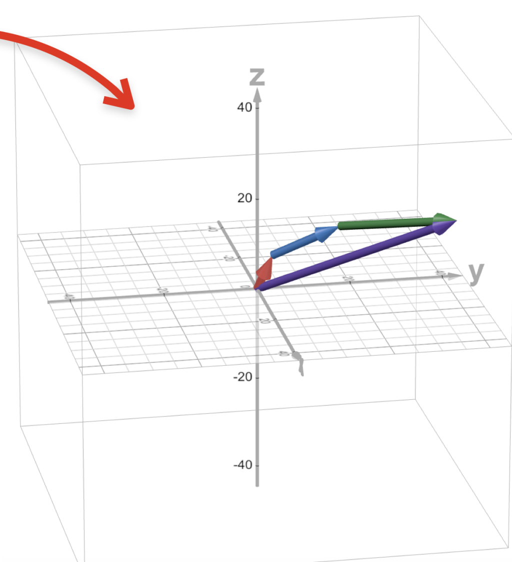
The Language of Linear Algebra

by DIBEOS

Algebraic | **Geometric**

$$x\begin{bmatrix}1\\1\\3\end{bmatrix} + y\begin{bmatrix}2\\3\\2\end{bmatrix} + z\begin{bmatrix}3\\2\\1\end{bmatrix} = \begin{bmatrix}39\\34\\26\end{bmatrix}$$

$$\begin{bmatrix}x\\y\\z\end{bmatrix} = \begin{bmatrix}2.75\\4.25\\9.25\end{bmatrix}$$

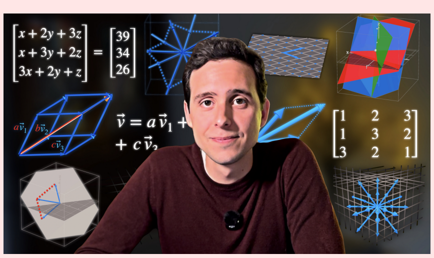


Click on the image above to see it in *https://www.desmos.com/3d*.

Contents

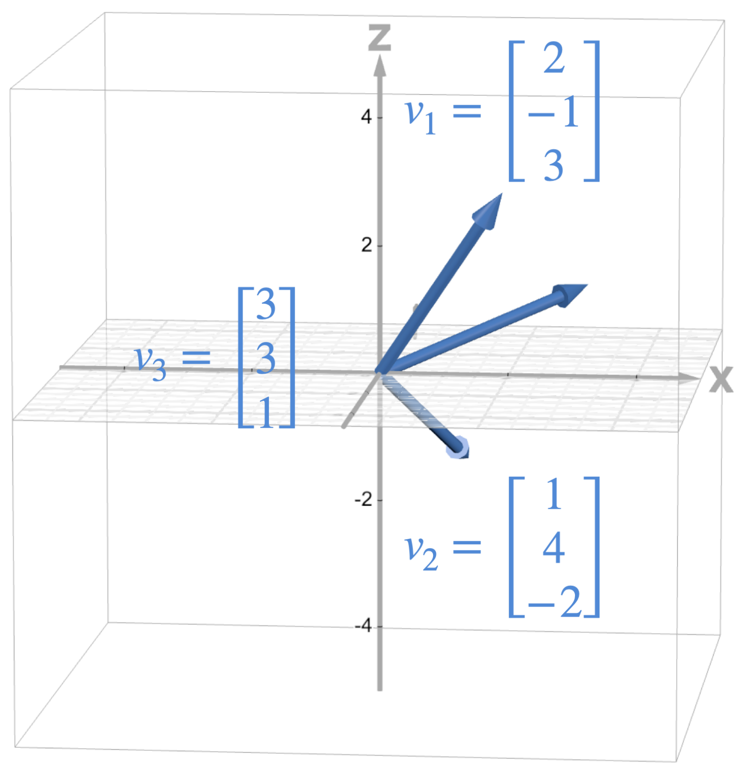
> “If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is.”
>
> **John von Neumann**

Suggestion

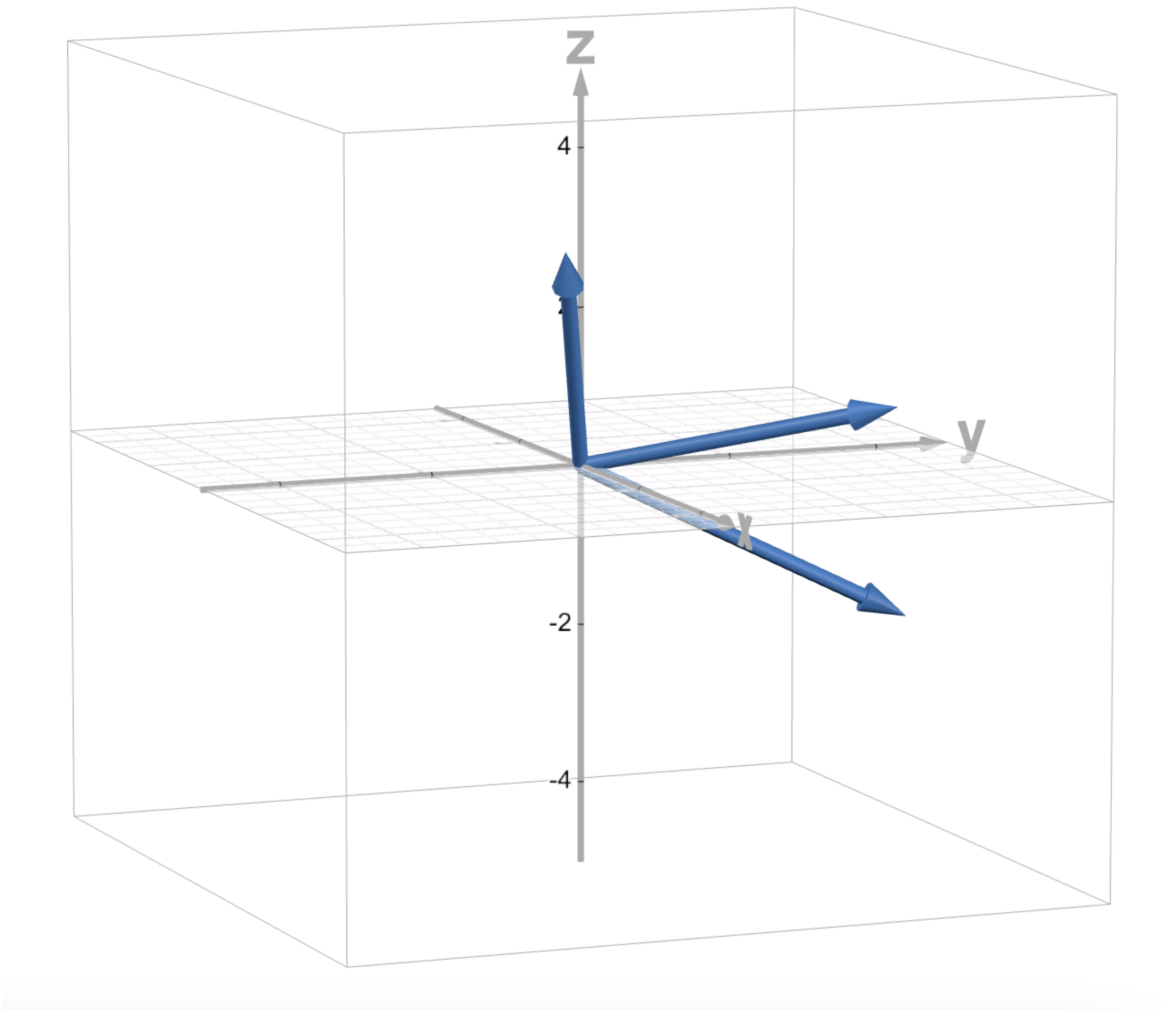


This material is a deeper look at the topics discussed in this YouTube video. We highly recommend watching the video first to get a basic understanding, and then reading this material. Click on the image.

Introduction



Imagine we have 3 vectors in space. At first, they seem completely unrelated to each other, but look closely. When we define them with these specific coordinates, then (technically) we can observe a hidden structure. Can you tell which?



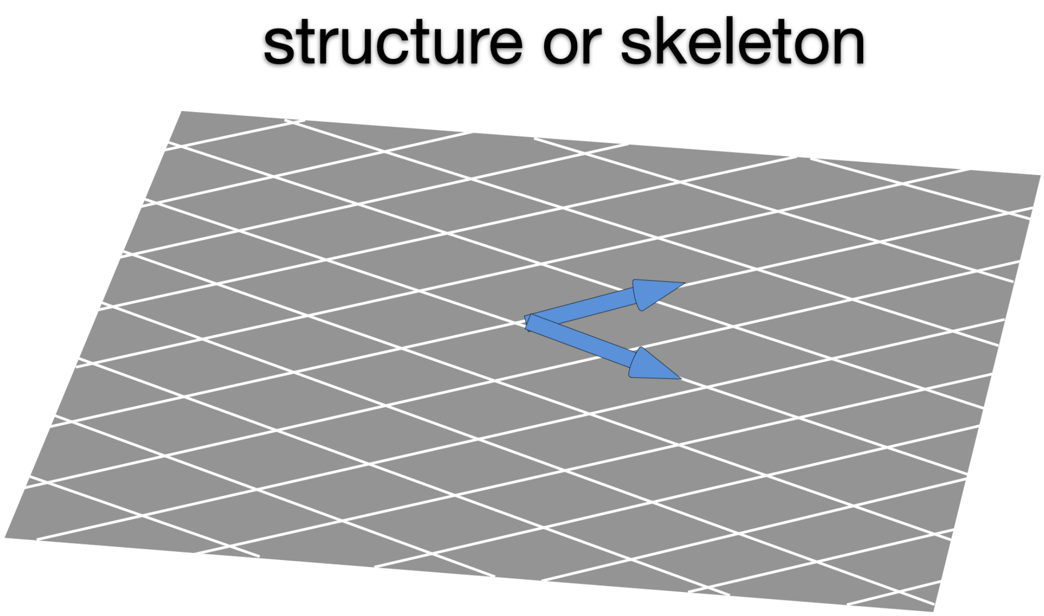
Click on the image above to see it in *https://www.desmos.com/3d*.

Your answer will show whether or not you have the necessary intuition to speak the "language" of linear algebra. So, let us rephrase the question:

When you put these 3 *vectors together, do they actually* ***generate*** *all* 3*D space around them?*

This question might sound confusing because of the word **"generate"**. And this will be one of the first words you will have to add to your linear algebra vocabulary.

Basis Vectors

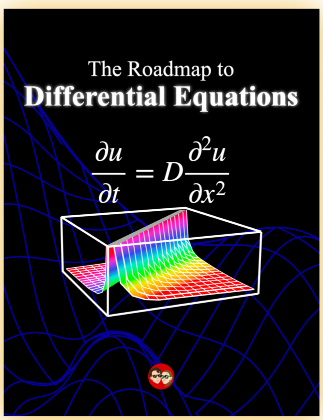


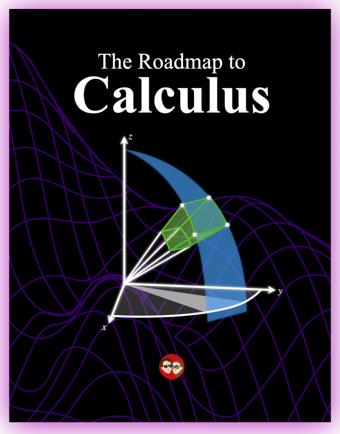
Imagine instead that we have a plane. I can draw 2 **vectors** in it such that they are not aligned. These 2 vectors will be the structure (or the *"skeleton"*) of the entire space that we are trying to describe. In this case, the space is a plane.

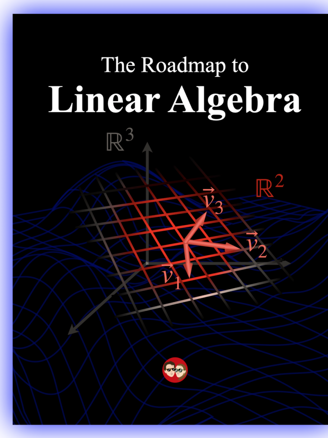
Just as a building has a skeleton frame, which we then cover with other layers of bricks, concrete, paint and decorations, so that the whole building emerges from it, we can do something similar with this plane.

CLICK HERE TO CONTINUE READING

Do not forget to check out our catalog of learning material. You might find something interesting. Just click on one of these covers:







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