

Introduction to *Linear transformations*

What you need to know already:

- ▶ Basic facts about vectors and matrices.
- ▶ What a function is.

What you can learn here:

- ▶ The definitions and basic facts about the most important type of functions used in linear algebra.

Given the title, are we going to learn some magic tricks?

Well, it depends on what you consider as magic. If you expect smoke, mirrors, wild animals and beautiful young women in skimpy clothes, I am afraid you will be disappointed.

But if you expect some unexpected phenomena that will increase your appreciation for what can be done with careful investigation, planning and practice, then you are in for a treat in this short chapter.

So, what kind of transformations will we see?

Good question, since I will start by clarifying what the word “*transformation*” means in linear algebra. We will then proceed to see how to achieve them and what properties they have, culminating in a very interesting and, yes, surprising discovery.

I am not sure I am very excited about the prospect of more words and more theory!

I can sympathize, so I will try to make you more interested in it by mentioning that linear transformations are a key tool to develop CGI movies.

Will we see how that is done?

Eventually, if you are interested in that! But, alas, not in this course, as you will need much more content and time to get there.

In the meantime, when you watch the next CGI movie, think of how linear transformations may be working behind the scene.

And spoil a pleasant experience? I don't think so!

I was thinking in terms of adding to it, but that being the case, let's see if I can convince you with the technical details...

Summary

- Linear transformations are a key tool in linear algebra and their applications spread widely to the real world, although greater depth must be achieved before being able to develop such realistic uses

Common errors to avoid

- This is going to be a technical and jargon-intensive chapter. Discipline is the key for now!

What questions do you have for your instructor?