**PEA thing, no clue what I’m doing**

So the math topic that I have studied this term that I have chosen is the almighty vector. A short summary of it is that vectors are the length of arrows and their direction. The long version of it is this: a vector is an arrow placed on a coordinate system, x representing the height, y representing the horizontal length and you could also add z for the 3-dimensional version of it. As long it doesn’t change shape, a vector will always be the same as long it is anywhere on the coordinate system, but for ease of life, we generally leave them in the middle. You can add and subtract vectors by simply adding/subtract all of their components together. For example, we want to add vector A and B. A=[3, 4] and B=[-2, 5]. We add up 3 and -2 together and 4 and 5 together. We end up with C, which is [1, 9]. It is difficult to visualize in a text format, but a quick google search might do the trick. Vectors can also represent different values, such as Km/h or centimetres. It is as if we replace the x and y axis with centimetres vertically and horizontally.

Now the field I decided to compare vectors to, is game development. The role of a game developer is to obviously… MAKE GAMES. Most companies these days use engines to create their game. Oh… you don’t know what an engine is Mr. Math man? Don’t worry here is a simple explanation of it, engines simplify life, they take care of most of the math required to have 2d or 3d objects that move around in a game, including the physics, their collisions and meshes (how they look like on-screen). They even compile your game when it’s done so you won’t need to go through any time-consuming processes and spend more time developing. There are plenty of engines (private and public) around the world, but the most popular ones are Unity, Unreal Engine and Godot (personal favourite). As I mentioned before, they take care of most of the math required to make the physics and movement, but there is one thing that they will probably never be able to get rid of, and that is Vectors.

That’s why we still need Vectors, and we will probably always need some in game development. According to Marco Mignano, indie game developer, in his article “*Vector in game development: Understand the basics of vector math*”, he explains that Vectors are the most basic tools in game development. The speed that Ferrari Laferrari is going in that racing game, VECTORS. Where and how fast the bullet travels in your favourite fps game, VECTORS again. The shape and size of that massive mountain in that awesome open-world game, VECTORS once more. Vectors are utilized in almost every aspect of a game and knowing how to use them is crucial when it comes to game development. Unless you’re making a text-based game in a console of course, but we don’t talk about those.