

# Math Graphics for 3b1b Internship Application

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Hi 3b1b! I've done most of my homework in LaTeX for the past few years as I am passionate about making the information I'm presenting aesthetically beautiful, clear, and concise. While most of my homework doesn't include images here is a selection of a few I've made over the years. None of these have been required so I never put in exceptional effort, but I promise I can do much better than what you see here! Most are made with the TikZ package but I am also very capable with creating great content with Python and Mathematica. I taught myself most of the programming languages I know so I'm very capable of learning new software!

## 1 Geometric Optics

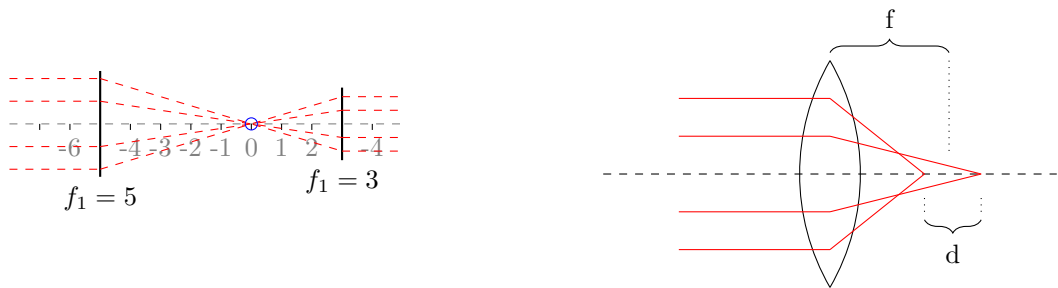


Figure 1: TikZ diagrams of optical scenarios for a freshman physics lab.

## 2 Linear Algebra

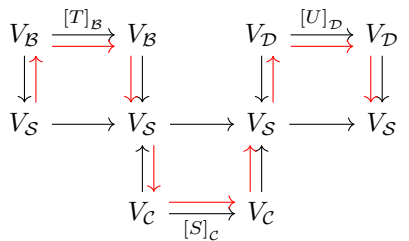


Figure 2: Commutative diagram used to show the process through which one can solve a rotational problem via an easy change of basis.

### 3 Solid State Physics

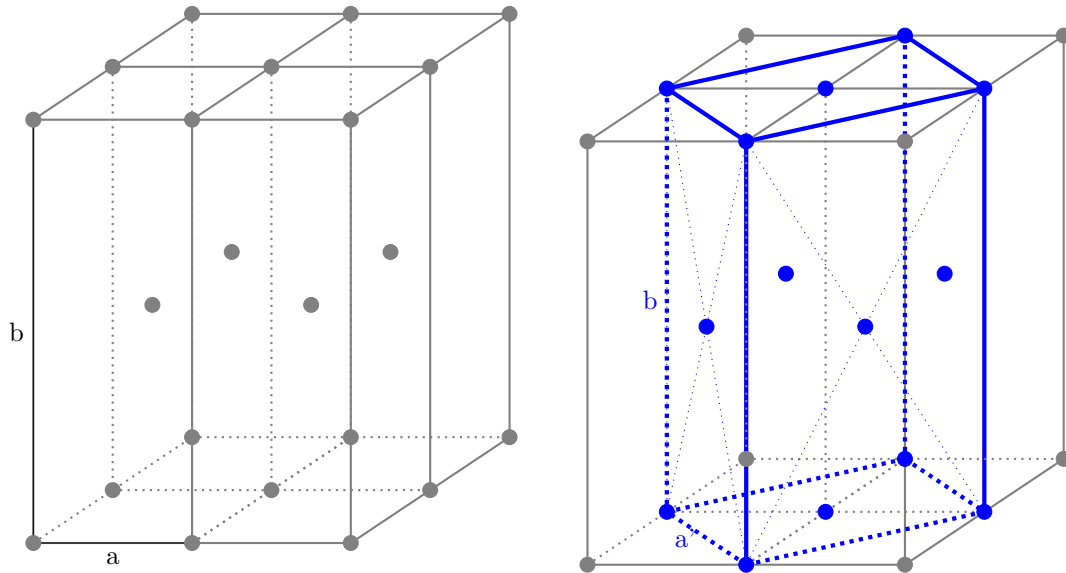


Figure 3: Diagram illustrating the equivalence of Body-Centered Tetragonal and Face-Centered Tetragonal structures with unit cell size. In this diagram  $a \neq a'$ .

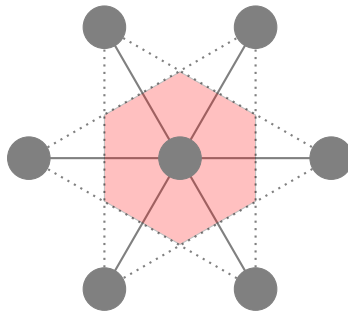


Figure 4: 2D Representation of the Brillouin Zone for Hexagonal Lattice.

## 4 Lagrangian Mechanics

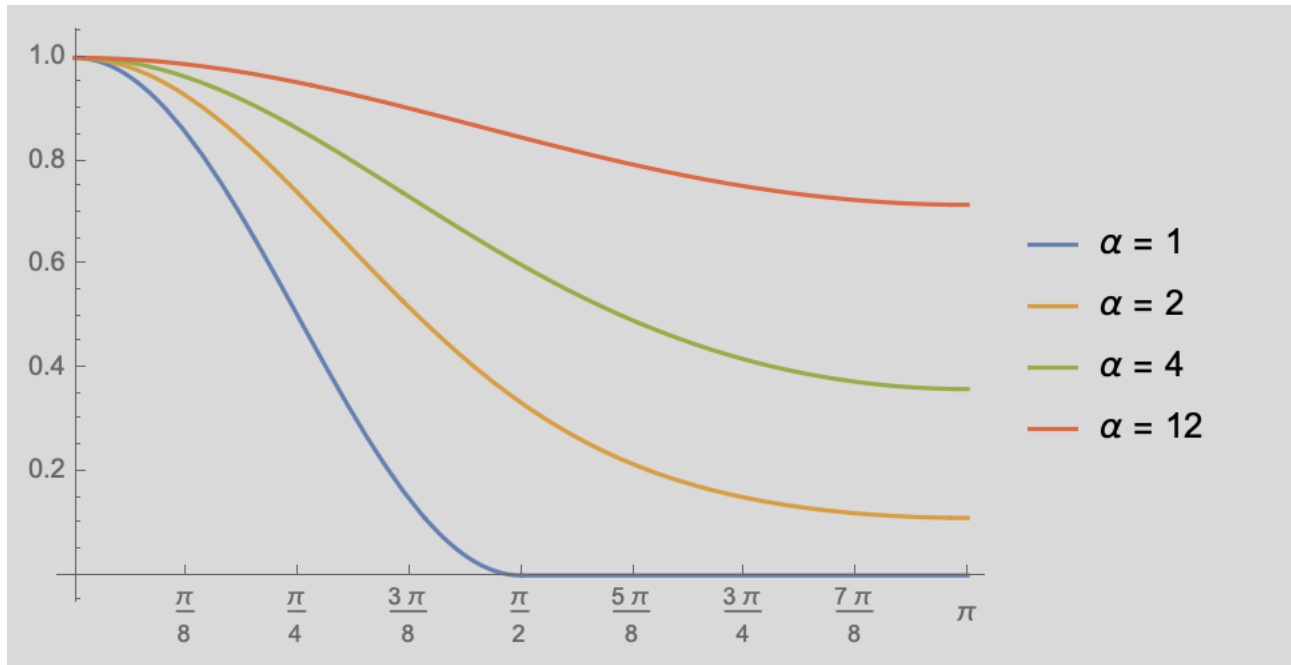


Figure 5: Graph for a scattering problem made in Mathematica. I included this to show techniques in translating moving graphics into a stationary image but still convey a varying parameter  $\alpha$ .