HOW TO UNDERSTAND AND USE THIS CODE IN THE FUTURE

$\int\int\int dydxdz$ = YXZ is the format used in this document.

Understanding the code

This explanation is based off the code in 'integration_order6 (YXZ)' – the most recent/powerful version used to create applied integration videos.

Lines 3-59: These lines are all for configuring the order of integration. However, it is important to set g1,g2,f1,f2 correctly depending on the video you want to create. Care should also be taken to express it in the correct form for the order of integration desired. ($y = x^2$ vs $x = \sqrt{y}$). Adjust this for the volume configuration you want.

Line 61: The SPEED_FACTOR helps reduce rendering times. It is best to use a SPEED_FACTOR of 5 when proving the video works for a speedier workflow. A SPEED_FACTOR of 1 should be used when rendering for the final time. Expect rendering times of 5-20 minutes typically.

Lines 63-101: This is the generate volume function.

Line 65: This is the only line in the generatevolume function that needs editing. Here you should change the getConfig to the one you want. The last letter of the config should match your final integration. For example YXZ would be used for both XYZ and YXZ since you only care about the z sweep being last.

Line 104-120: Some configuration that doesn't need to be touched.

Line 129: The axes function. Parameters here can be adjusted as desired.

Lines 146-147: The two limit curves that can be adjusted as needed.

Lines 150-178: The creation of the surfaces. Can be adjusted as needed.

Lines 181-183: The very first stage of your applied integration. The name labels haven't been changed to match the actual element but this should be your first small delta element. Change this as needed

Lines 185-187: The completion of the first integration. Change this as needed

Lines 189-218: The second integration beginning with the delta element and then the full plane. Change this as needed

Lines 223-247: Labels for the lines and surfaces. Change this as needed.

Lines 250-268: The final constant limits. These need to be set up as seen in 254/255 and 264/265. Change this as needed.

Lines 270-340: Most of the LaTeX used in the video. Reading the code should help you understand which elements are where and how you can configure them. Change this as needed.

Lines 344-348: Creating stages of the volume sweep using the generate volume function. This is important because it allows for a smooth sweep. Change the numbers as needed.

Lines 352-387: This is the part of the code that actually runs the scene. It is pretty self explanatory and elements can be changed to create the desired video.

Getting a video

In a terminal input this code:

manim -pql [File Name] [Scene Name]

Changing -pql to pqh changes the picture quality from high to low.

The Scene Name is in Line 123

Creating a voiceover

This is created separately using a script and the voice recorder app on my phone. A video editor was then be used to put all these elements together. Microsoft Clipchamp or iMovie are all you need.