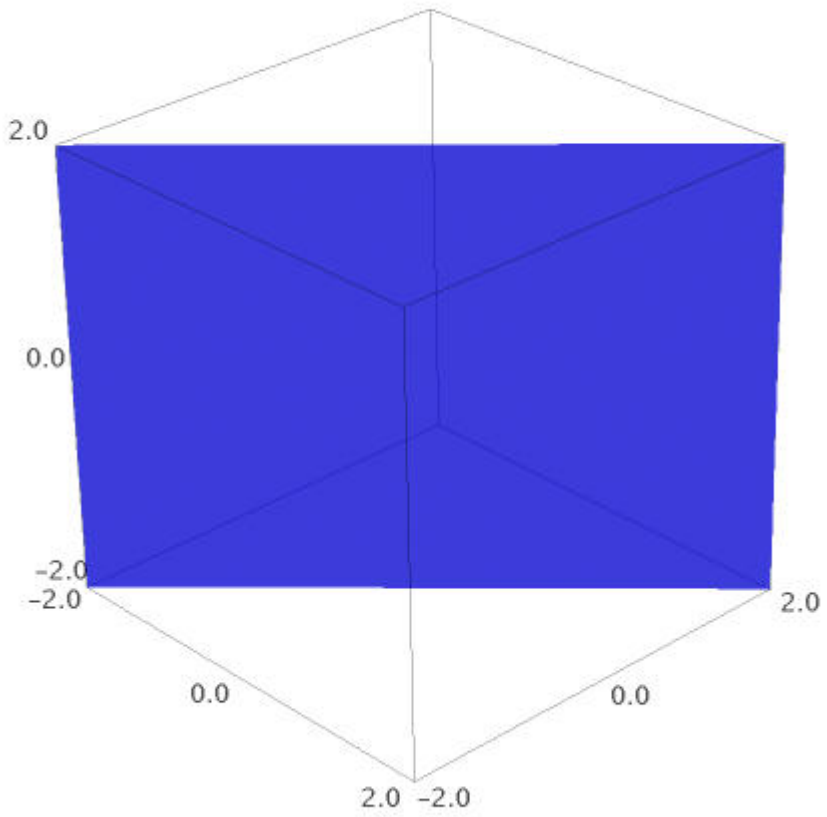
Regions

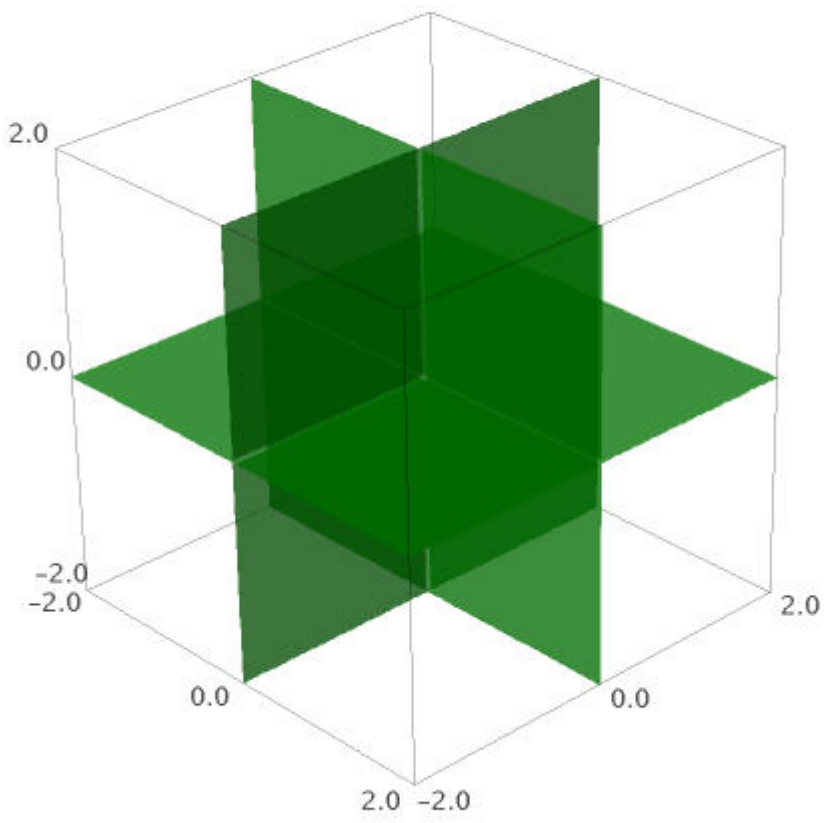
Regions of triple integrals

One of the problems asked to draw the region of integration for the triple integral ∫_0^1 ∫_0^x ∫_0^y dz dy dx. Here is a way to draw the region in sage:

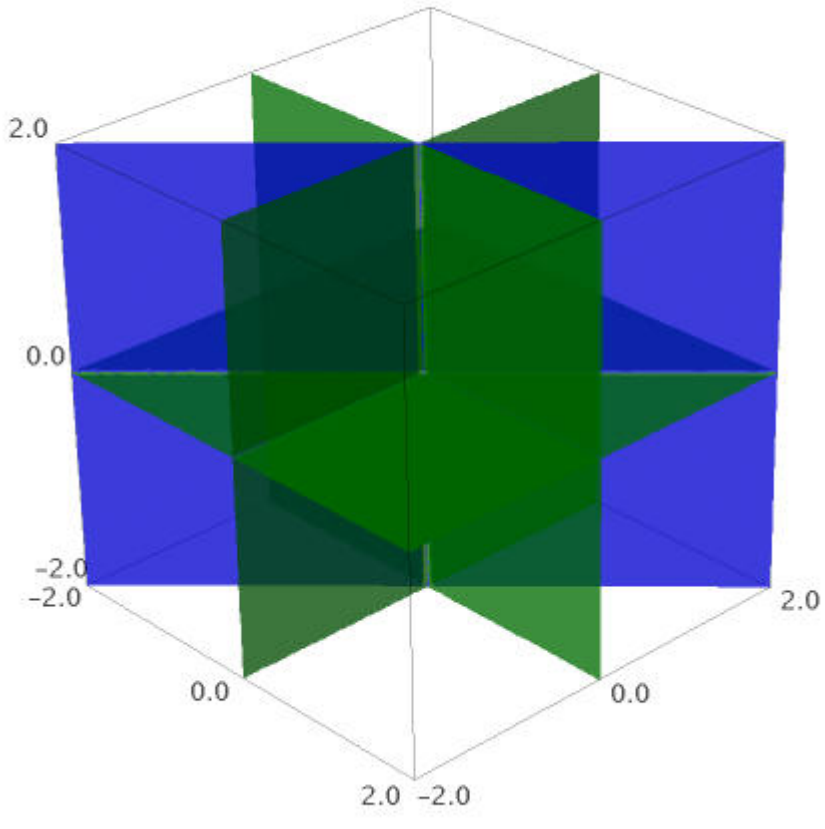
```
x, y, z = var('x, y, z')
P = implicit_plot3d(x-y,(x,-2,2),(y,-2,2),(z,-2,2),color='blue',opacity=0.7)
show(P)
```



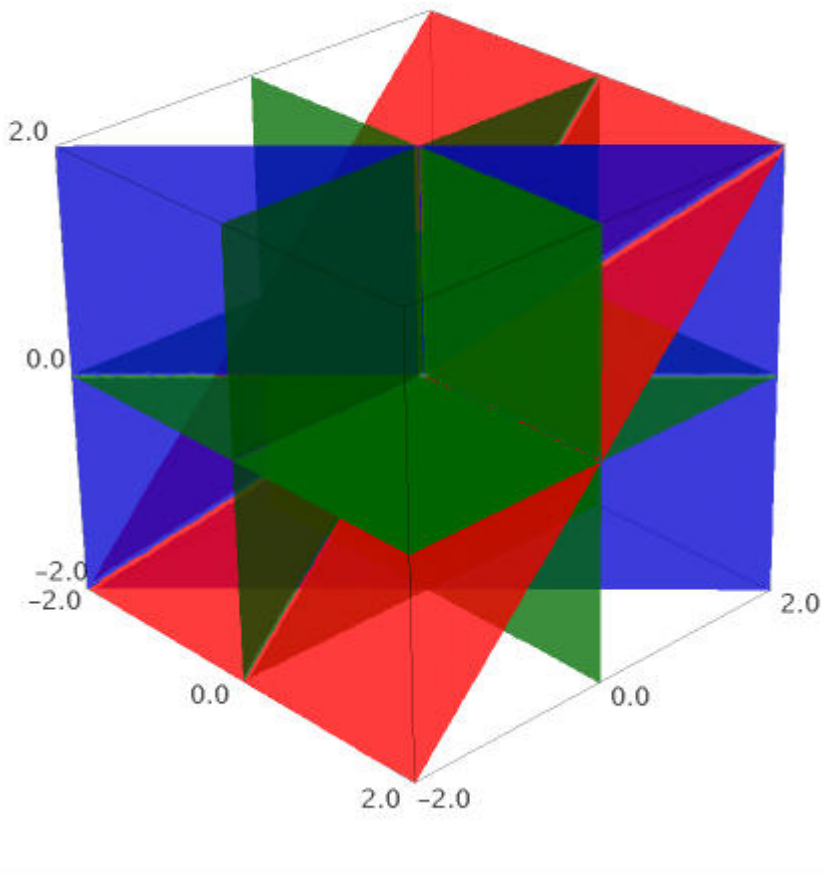

```
Q1 = implicit_plot3d(x,(x,-2,2),(y,-2,2),(z,-2,2),color='green',opacity=0.7)
Q2 = implicit_plot3d(y,(x,-2,2),(y,-2,2),(z,-2,2),color='green',opacity=0.7)
Q3 = implicit_plot3d(z,(x,-2,2),(y,-2,2),(z,-2,2),color='green',opacity=0.7)
show(Q1+Q2+Q3)
```




```
show(Q1+Q2+Q3+P)
```




```
R = implicit_plot3d(z-y,(x,-2,2),(y,-2,2),(z,-2,2),color='red',opacity=0.7)
show(Q1+Q2+Q3+P+R)
```



So the region is above the green plane in the xy plane, in front of the blue plane, and below the red plane.