Some comments on Problem 6, page 316

"Describe as an elementary region the solid cut out of the ball x^2+y^2+z^2<=4 by the elliptic cylinder 2x^2+z^2=1."

The graph below (generated with Maple) should give you a perfect idea on the shape of the solid under consideration.

```
> with(plots):
  F:=plot3d([cos(t)/sqrt(2),u,sin(t)],t=0..2*Pi,u=-2..2,color=yellow
  ):
  G:=plot3d([2*cos(t)*sin(u),2*sin(t)*sin(u),2*cos(u)],t=0..2*Pi,u=0
  ..Pi,style=wireframe,color=black, numpoints=10000):
  display(F,G,axes=frame,labels=[x,y,z]);
```
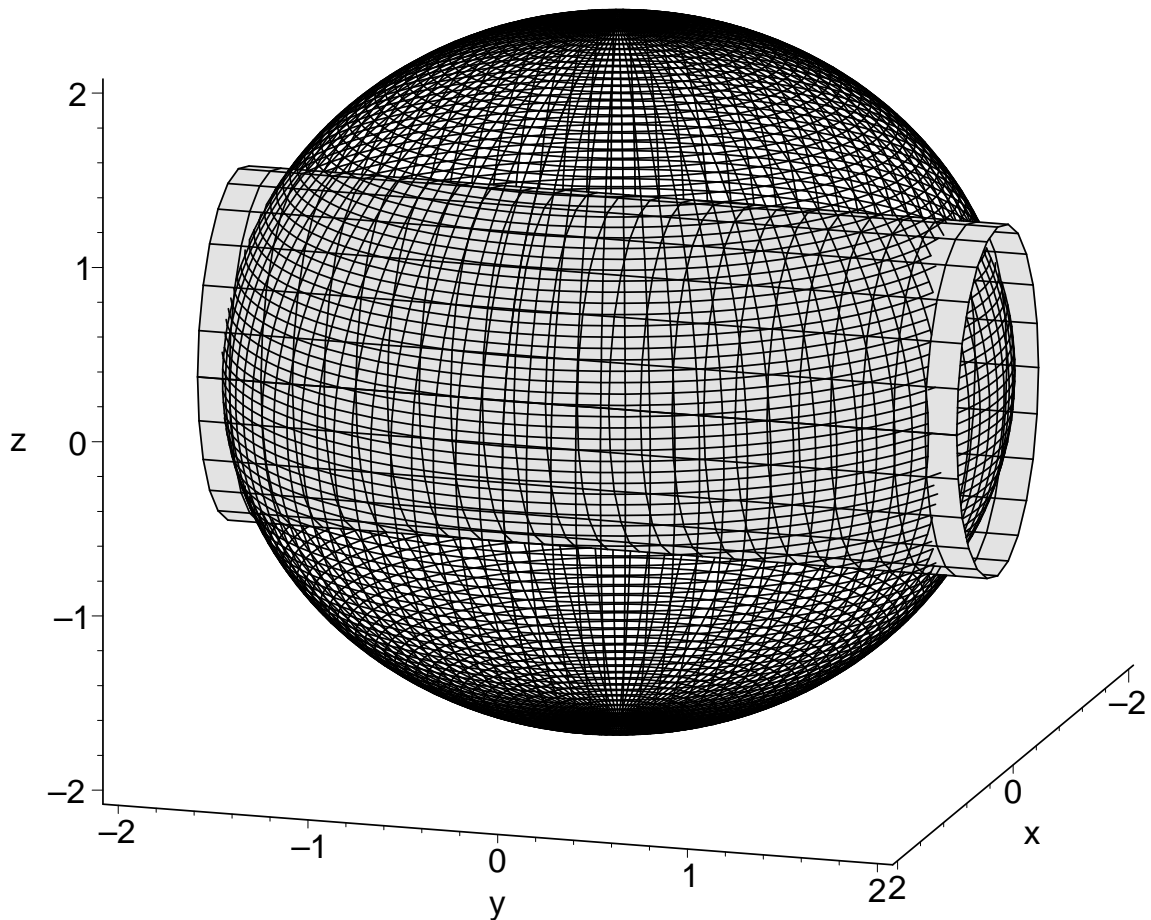
Note. If the base D for the integration is chosen in the xy plane the next pictures justify why the computation of the volume will be much complicated. (The second picture gives the projection onto the yz plane.)