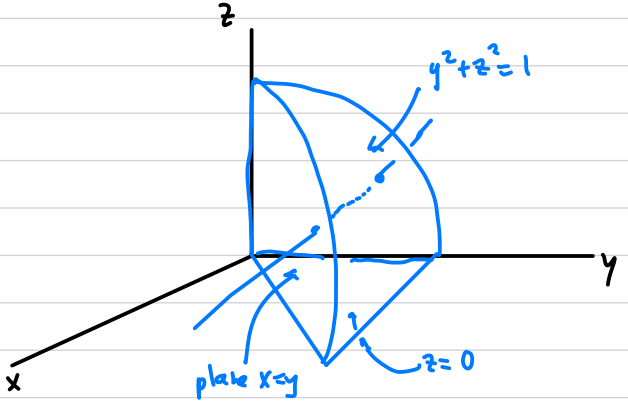
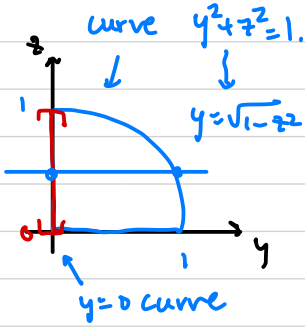
Ex Rewrite $\int_0^1 \int_0^y \int_0^{\sqrt{1-y^2}} f(x,y,z)\, dz\,dx\,dy$

as $\iiint f(x,y,z)\, dx\,dy\,dz$. ← project onto yz-plane

First: DRAW THE REGION ~ hint: start w/ outer two integrals.





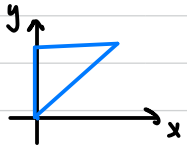
← plane x=y.

$$\int_0^1 \int_0^{\sqrt{1-z^2}} \int_0^y f(x,y,z)\, dx\,dy\,dz$$

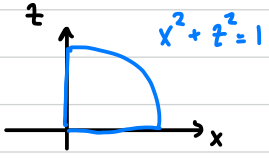
endpts ↑ curves ↑ surfaces ← yz-plane

Exercise: $dz\,dy\,dx$
$dy\,dz\,dx$
$dx\,dz\,dy$ ...

$$\int_0^1 \int_x^1 \int_0^{\sqrt{1-y^2}} f(x,y,z)\,dz\,dy\,dx$$



$$\int_0^1 \int_0^{\sqrt{1-x^2}} \int_x^{\sqrt{1-z^2}} f(x,y,z)\,dy\,dz\,dx$$



$$\int_0^1 \int_0^{\sqrt{1-y^2}} \int_0^y f(x,y,z)\,dx\,dz\,dy$$