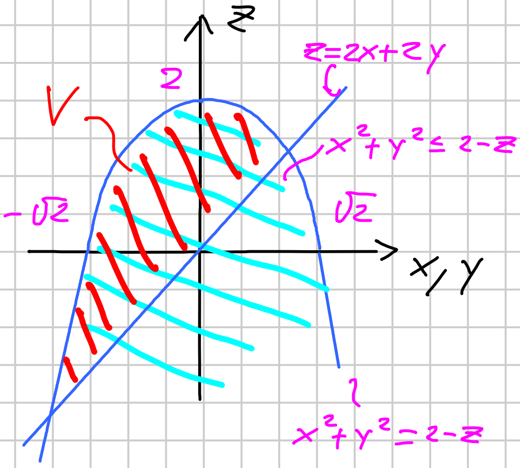
$A: \quad 2-x^2-y^2 \geq z \geq 2x+2y$



$2-x^2-y^2 \geq z \quad \rightsquigarrow \quad x^2+y^2 \leq 2-z$

$z \geq 2x+2y \qquad$ PIANO: $z=2x+2y$

STUDIAMO L'INTERSEZIONE

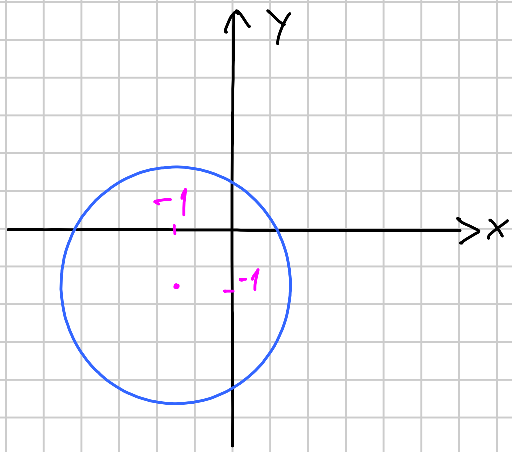
$$\begin{cases} x^2+y^2=2-z \\ z=2x+2y \end{cases} \rightsquigarrow \quad x^2+y^2=2-2x-2y$$

$x^2+y^2+2x+2y=2 \qquad (x+1)^2+(y+1)^2-2=2$

$(x+1)^2+(y+1)^2=4 \quad \rightsquigarrow$ CERCHIO CENTRO IN $(-1,-1)$ $R=2$

CAMBIO DI COORDINATE:

$$\begin{cases} x'=x+1 \\ y'=y+1 \end{cases} \rightsquigarrow \begin{cases} x=x'-1 \\ y=y'-1 \end{cases} \qquad z'=z$$

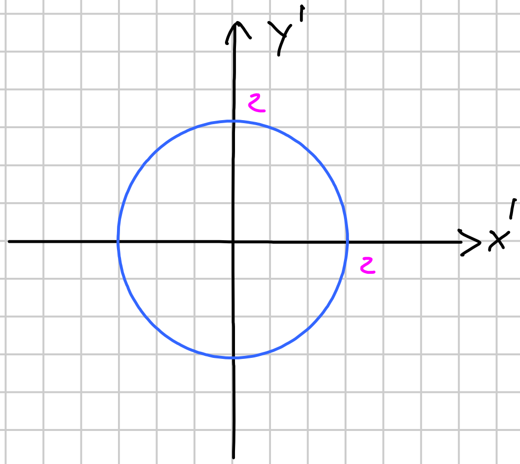


OSS: SI OMETTONO GLI APICI

$A': \quad 2-(x-1)^2-(y-1)^2 \geq z \geq 2(x-1)+2(y-1)$

$2-x^2+2x-1-y^2+2y-1 \geq z \geq 2x+2y-4$

$-x^2-y^2+2x+2y \geq z \geq 2x+2y-4$



CALCOLO DEL VOLUME

$$V=\int_0^{2\pi}\int_0^2\int_{2\rho\cos\theta+2\rho\sin\theta-4}^{-\rho^2+2\rho\cos\theta+2\rho\sin\theta} \rho \, dz \, d\rho \, d\theta =$$

$$=\int_0^{2\pi}\int_0^2 \rho\left(-\rho^2+\cancel{2\rho\cos\theta}+\cancel{2\rho\sin\theta}-\cancel{2\rho\cos\theta}-\cancel{2\rho\sin\theta}+4\right) d\rho \, d\theta =$$

$$= \int_0^{2\pi} \int_0^2 \left(-\rho^3 + 4\rho\right) d\rho \, d\theta = \int_0^{2\pi} \left[-\frac{\rho^4}{4} + 2\rho^2 \right]_0^2 d\theta =$$

$$= 2\pi\left(-4 + 8\right) = 8\pi$$