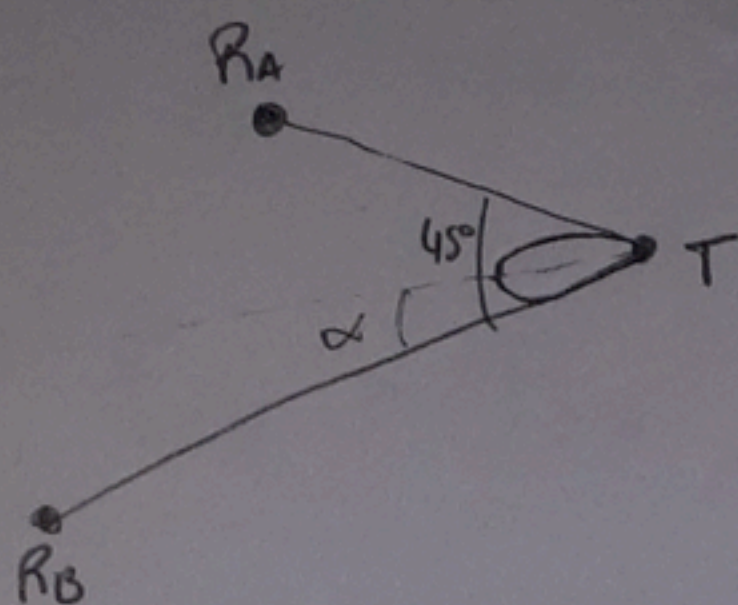


c) Ahora la idea es que la antena se instale en T sea una antena directa igual a P_B .



Asumo $\alpha \in [0, \pi/4]$

$$P_{RA} = P_T G_{RA} \left(\frac{\lambda}{4\pi r_A} \right)^2 G_T \cos(\pi/4 - \alpha)$$

$$P_{RB} = P_T G_{RB} \left(\frac{\lambda}{4\pi r_B} \right)^2 G_T \cos(\alpha)$$

Deseo que $P_{RA} = P_{RB}$ Esta hipótesis es para resolverlo a mano.

$$\Rightarrow \frac{P_{RA}}{P_{RB}} = \frac{G_{RA} r_B^2 \cos(\pi/4 - \alpha)}{G_{RB} r_A^2 \cos(\alpha)} = 1$$

Usando que $\cos(\pi/4 - \alpha) = \frac{\cos \alpha - \text{sen} \alpha}{\sqrt{2}}$

$$G_{RA} r_B^2 (\cos \alpha - \text{sen} \alpha) = \sqrt{2} G_{RB} r_A^2 \cos \alpha$$

$$\Rightarrow \cos \alpha - \sqrt{1 - \cos^2 \alpha} = 1,1 \sqrt{2} \cos \alpha$$

$$-0,56 \cos \alpha = \sqrt{1 - \cos^2 \alpha} \Rightarrow 0,56^2 \cos^2 \alpha = 1 - \cos^2 \alpha$$

$$\cos \alpha = \pm \sqrt{\frac{1}{1,31}} = \pm 0,51 \text{ rad verifica la suposición}$$

$$\alpha = 0,51 \text{ rad}$$

Si lo queremos resolver bien acorde a la letra hacemos:

min P_T
 α

sa $P_{RA} > 0,01$

$P_{RB} > 0,01$