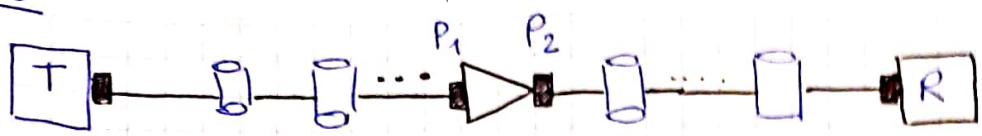
Ej3



Perdidas

Conectores : $4 * 1\,dB = 4\,dB$

FO : $2\,dB$

$At = \frac{5\,dB}{100\,m}$

Empalmes con $3\,dB$

↳ Ganancia del Amplificador : $G = 10 \log\left(\frac{P_2}{P_1}\right) = 10 \log 100 = 20\,dB$

$PT_x = 1W = 10^3\,mW = 30\,dBm$

$SR_x = 10\,\mu W = 10 * 10^{-3}\,mW = -20\,dBm$

↳ Si hay n bobinas
La Longitud Total del enlace $d = 400 * n + r$ en metros
donde $r \in [0, 400]$

En la ecuacion :

$PT_x + G = SR_x + P$

$30\,dBm + 20\,dB = -20\,dBm + \left(4\,dB + 2\,dB + 3 * n + \frac{5}{100} * (400n + r)\right)$

$70\,dB = 6\,dB + 3n + 20n + \frac{r}{20}$

$64 = 23n + \frac{r}{20}$, por la desigualdad de r

↳ $23n \leq 23n + \frac{r}{20} = 64$

$n \leq \frac{64}{23} < 3$

↳ $64 = 23n + \frac{r}{20} \leq 23n + \frac{400}{20} = 23n + 20$

$44 \leq 23n$

$1 < \frac{44}{23} \leq n$ ∴ $1 < n < 3 \rightarrow \boxed{n = 2}$

↳ $64 = 23n + \frac{r}{20} = 46 + \frac{r}{20}$

$18 = \frac{r}{20}$ ∴ $\boxed{r = 360\,m}$

∴ $d = 400 * n + r = 400 * 2 + 360 = 1160\,m$