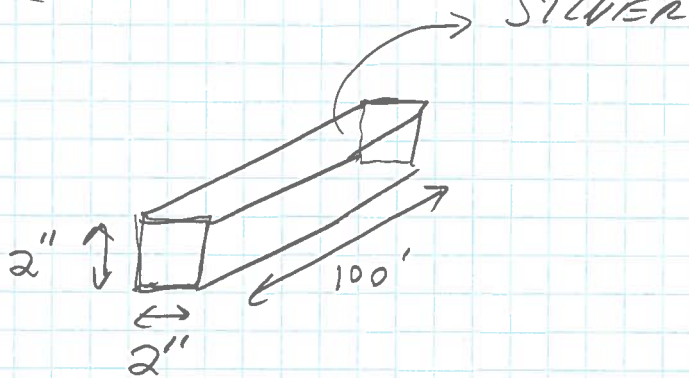
FIND "R" FOR:

(@ 20°C)



$R = \rho \frac{\ell}{A}$, $\rho = 9.9 \frac{CM\text{-}\Omega}{FT}$ ← ρ

$\ell = 100$ FEET ← ℓ

NEED A IN CM:

$A = 2" \times 2" = 4$ SQ INCHES

OR $2000\,MIL \times 2000\,MIL = 4 \times 10^6$ SQ MILS

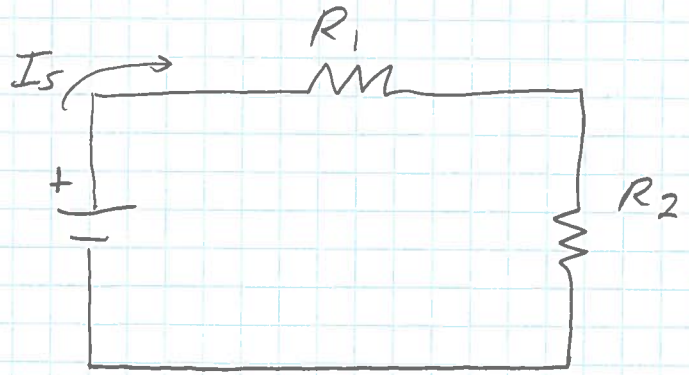
1 SQ MIL $= \frac{4}{\pi}$ CM

$\therefore A = (4 \times 10^6 \text{ SQ MILS})\left(\frac{4}{\pi} \frac{CM}{SQ\,MIL}\right)$

$= 5.093 \times 10^6$ CM ← A

$\therefore R = \frac{\left(9.9 \frac{CM\text{-}\Omega}{FT}\right)(100 \text{ FEET})}{5.093 \times 10^6 \text{ CM}} = 194.4 \times 10^{-6}\ \Omega$

FIND R_1 :



GIVEN

$P_{R_T} = 112\ mW$

$I_S = 10\ mA$

$P_{R_2} = 33\ mW$

$P_{R_1} = P_{R_T} - P_{R_2} = (112\ mW - 33\ mW)$

$= \underline{79\ mW}$

BUT $P_{R_1} = (I_S)^2 R_1$

i.e. $79\ mW = (10\ mA)^2 (R_1)$

OR $R_1 = \boxed{790\ \Omega}$