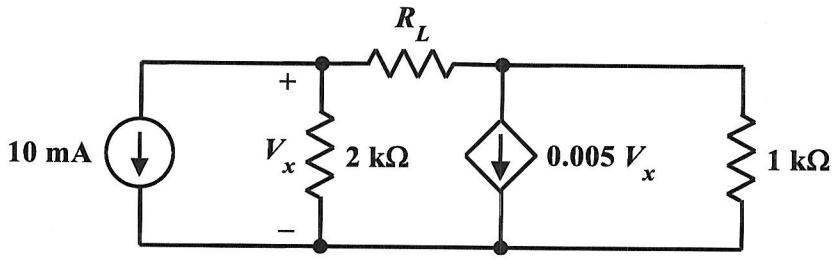
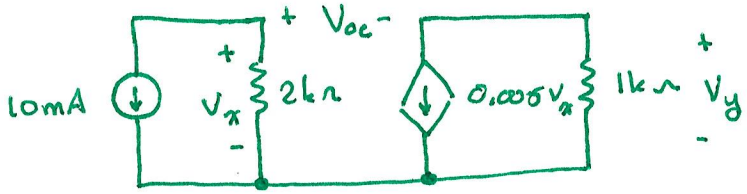
EE 2240

Homework Problem #049



What value of R_L will absorb maximum power from the remainder of the circuit?

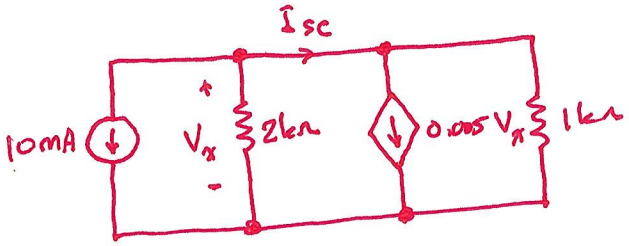


$V_x = -(2k\Omega)(10mA) = -20V$

$V_y = -(1k\Omega)(0.005 V_x)$

$= 100V$

$V_{oc} = V_x - V_y = -120V$



$10mA + \frac{V_x}{2k\Omega} + 0.005 V_x + \frac{V_x}{1k\Omega} = 0$

$\Rightarrow V_x = -\frac{20}{13} V$

$I_{sc} = -10mA - \frac{V_x}{2k\Omega}$

$= -\frac{120}{13} mA$

$R_T = R_N = \frac{V_{oc}}{I_{sc}} = \frac{-120V}{-\frac{120}{13}mA} = 13\Omega$

Choose $R_L = R_T = R_N = 13\Omega$