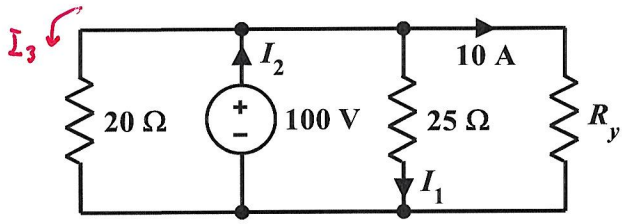
EE 2240

Homework Problem #010

For the circuit shown below:



a. Determine the value of I_1.

$$I_1 = \frac{100\text{V}}{25\,\Omega} = 4\text{A}$$

b. Determine the value of R_y.

$$(10\text{A})R_y = 100\text{V} \Rightarrow R_y = \frac{100\text{V}}{10\text{A}} = 10\,\Omega$$

c. Determine the value of I_2.

$$I_3 = \frac{100\text{V}}{20\,\Omega} = 5\text{A}$$

$$I_2 = I_3 + I_1 + 10\text{A} = 19\text{A}$$

d. How much power does R_y absorb?

$$P_y = (100\text{V})(10\text{A}) = 1000\text{W} = 1\text{kW}$$

e. How much power does the independent voltage source deliver?

$$P_s = (100\text{V})I_2 = (100\text{V})(19\text{A})$$

$$= 1900\text{W} = 1.9\text{kW}$$