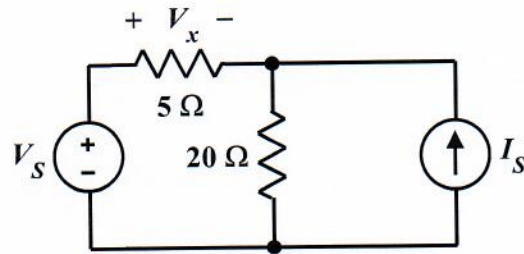


EE/EET 2240
Homework Problem #020

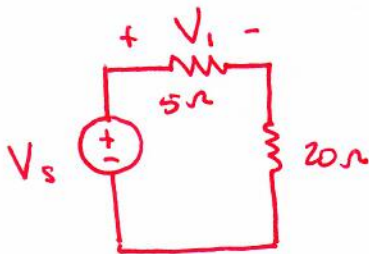


The voltage V_x can be described by the equation

$$V_x = K_1 I_s + K_2 V_s$$

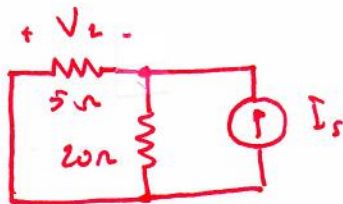
where I_s and V_s are the values of the two independent sources. Determine the numerical value of each of the coefficients, K_1 and K_2 .

This is a superposition problem.



$$V_1 = \frac{5}{5+20} \cdot V_s = \frac{1}{5} V_s$$

$$\therefore K_2 = \frac{1}{5}$$



$$V_2 = - \frac{5 \cdot 20}{5+20} \cdot I_s$$

$$= - \frac{100}{25} I_s = -4 I_s$$

$$\therefore K_1 = -4$$

$$\Rightarrow V_x = V_1 + V_2 = -4 I_s + \frac{1}{5} V_s$$

$$\therefore K_1 = -4, \quad K_2 = \frac{1}{5}$$