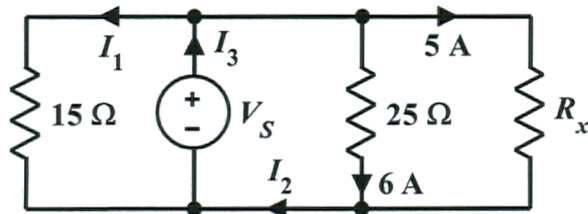


Homework Problem #06

For the circuit shown below:



- a. Determine the value of V_S .

$$V_S = (25\Omega)(6A) = 150V$$

- b. Determine the value of I_1 .

$$I_1 = \frac{V_S}{15\Omega} = \frac{150}{15} = 10A$$

- c. Determine the value of I_2 .

$$I_2 = 5 + 6 = 11A$$

- d. Determine the value of I_3 .

$$I_3 = I_1 + I_2 = 10 + 11 = 21A$$

- e. Determine the value of R_x .

$$R_x = \frac{150V}{5A} = 30\Omega$$

- f. How much power does the 15Ω resistor absorb?

$$P_{15} = (I_1)^2(15\Omega) = (10)^2(15) = 1500W$$

- g. How much power does the 25Ω resistor absorb?

$$P_{25} = (6A)^2(25\Omega) = 900W$$

- h. How much power does R_x absorb?

$$P_x = (5A)^2 R_x = (5)^2(30) = 750W$$

- i. How much power does the independent voltage source deliver?

$$P_S = V_S I_3 = (150V)(21A) = 3150W$$

- j. Verify that power is conserved.

$$P_{15} + P_{25} + P_x - P_S = 1500 + 900 + 750 - 3150 = 0$$

\therefore power is conserved