

ID# KEY

Quiz #2

EE 204-031

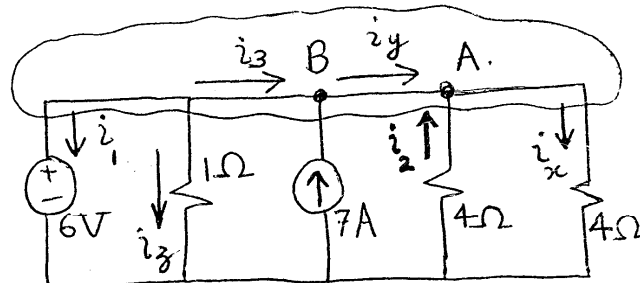
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Q

a) Find i_1, i_2, i_3

b) Find power dissipation of 1Ω resistor and power of $6V$ source. Indicate if power is absorbed or delivered.



a) Since $6V$ source is in parallel to the resistors

$$i_2 = -\frac{6}{4} = -\frac{3}{2} = -1.5A$$

$$i_x = +\frac{6}{4} = +\frac{3}{2} = +1.5A$$

Apply KCL at A.

$$i_y + i_2 = i_x \Rightarrow i_y = 3A$$

Apply KCL at B

$$i_3 + 7 = i_y \Rightarrow \boxed{i_3 = -4A}$$

Apply KCL at big node.

$$i_1 + i_3 + i_x = i_2 + 7 \Rightarrow i_1 = -1.5 + 7 - 1.5 - i_3$$

$$\Rightarrow i_1 = 4 - i_3 \Rightarrow i_1 = 4 - \frac{6}{1} = -2 \Rightarrow \boxed{i_1 = -2A}$$

b) $P_{1\Omega} = (i_3)^2 R = (6)^2 \times 1 = +36W$ absorbed

$$P_{6V} = +V i_1 = +(6)(-2) = -12W$$
 delivered