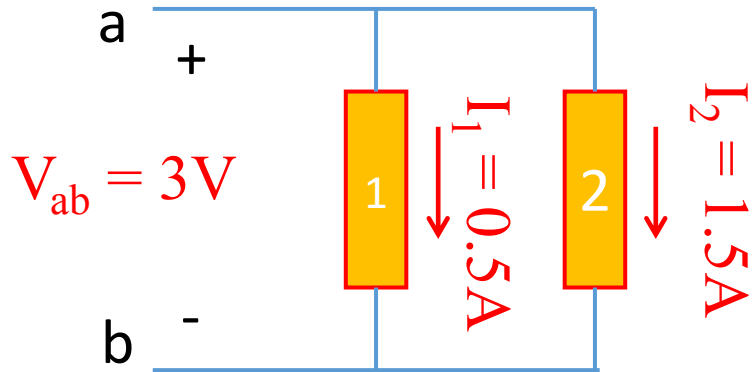


# EECS/CSE 70A Network Analysis I

## Homework #1 Solution

Problem 1: Find the power absorbed or supplied by each element.

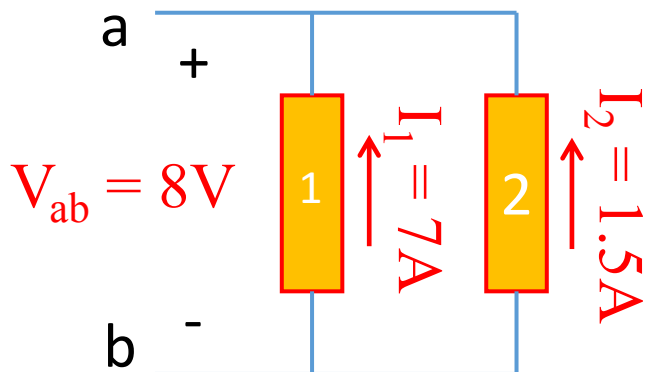


Solution:

$$P_1 = V_{ab}I_1 \text{ and } P_2 = V_{ab}I_2$$
$$\rightarrow P_1 = (3V) \times (0.5A) = 1.5W \text{ and } P_2 = (3V) \times (1.5A) = 4.5W$$

$P > 0$ , therefore the element is a power sink (it absorbs power)

Problem 2: Find the power absorbed or supplied by each element.



Solution:

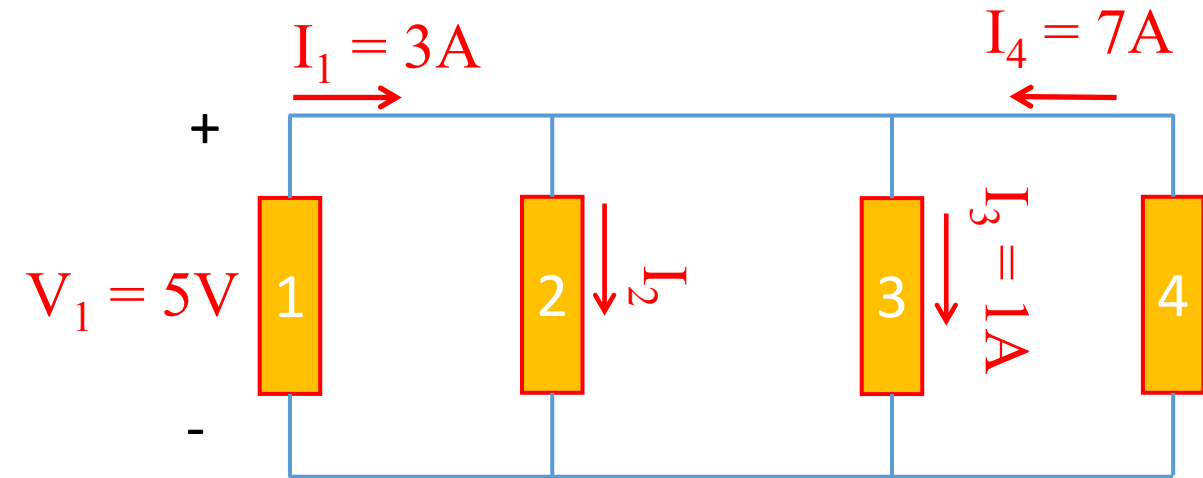
$$P_1 = V_{ab}(-I_1) \text{ and } P_2 = V_{ab}(-I_2)$$
$$\rightarrow P_1 = (8V) \times (-7A) = -56W \text{ and } P_2 = (8V) \times (-1.5A) = -12W$$

$P < 0$ , therefore the element is a power source (it supplies power)



### Problem 4:

- Find  $I_2$
- Find the power absorbed or supplied by each element.
- Is element 1 a source or a sink? Repeat for elements 2, 3 and 4.



### Solution:

(a)  $I_2 = I_1 + I_4 - I_3 \rightarrow I_2 = 3A + 7A - 1A = 9A$

(b)

$P_1 = V_1 I_1 \rightarrow P_1 = 5V \times (-3A) = -15W$  (supplied).

Similarly:

$P_2 = 5V \times 9A = 45W$  (absorbed)

$P_3 = 5V \times 1A = 5W$  (absorbed)

$P_4 = 5V \times (-7A) = -35W$  (supplied)

(c) Power is positive for elements 2 and 3, negative for elements 1 and 4. Thus 1 and 4 are power source. Elements 2 and 3 are power sinks.