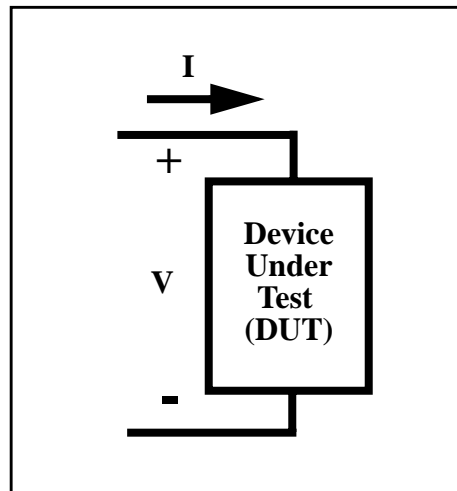
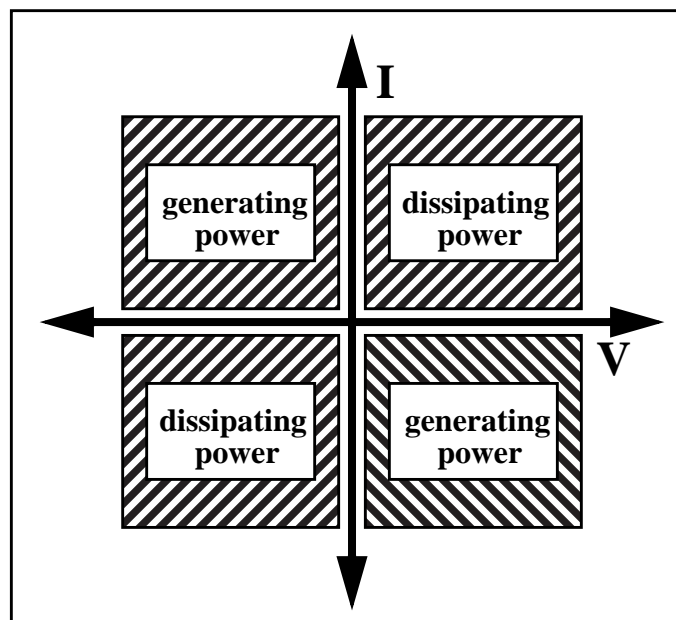


The Reference Direction

You can determine the power dissipation of a device by observing its current direction and magnitude and voltage magnitude and polarity. To calculate power dissipation (not generation!), you must reference the positive terminal as the one at which positive current flows into (PSC is obeyed).

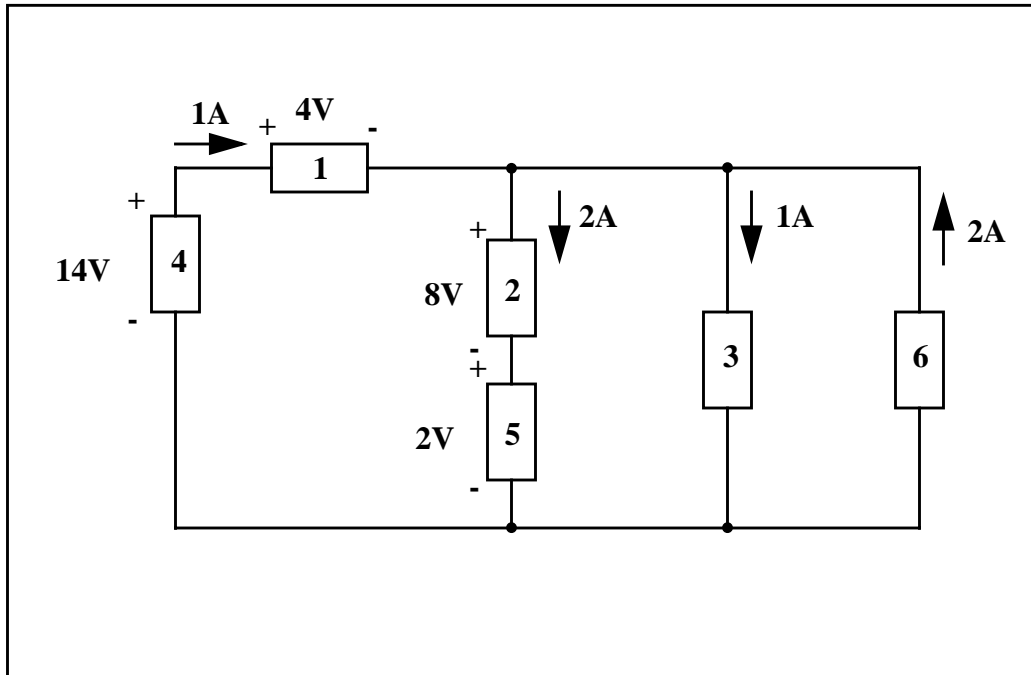


Since the VI product represents the power dissipated, positive power dissipation is power removed (dissipated as heat) from the electrical domain. Assuming that the voltage and current are defined as shown above we can determine the sign of the power dissipation from the signs of I and V . Hence we can determine whether a component is dissipating power or generating power simply by knowing the quadrant in which it is operating on its I - V plot as shown below.



Check your understanding.

For the circuit below, determine the power dissipation for each numbered element. Once you have determined the power consumption, determine what the element is and what its value is.



Ans: (1) 4W, resistor, 4 ohms; (2) 16W, resistor, 4 ohms; (3) 10W, resistor, 10 ohms; (4) -14W, voltage source 14V; (5) 4W, resistor, 1 ohm; (6) -20W, voltage source, 10V