

ECE 281 – Electrical Circuits And Instrumentation + LAB

LABORATORY HOMEWORK 1 ANSWERS

Answer 1)

A)

The image shows three circuit diagrams and several equations. The first diagram is a circuit with a 120V DC source on the left. A 4Ω resistor is in series with the source, with terminals x and y marked at its ends. The current through this resistor is labeled  $i_x$ . After the 4Ω resistor, the circuit splits into two parallel branches. The first branch contains an 18Ω resistor with current  $i_1$  flowing downwards. The second branch contains a 3Ω resistor in series with a 6Ω resistor, with current  $i_2$  flowing downwards through the 6Ω resistor. The second diagram is similar to the first, but the 3Ω resistor is omitted, leaving the 18Ω resistor and a 9Ω resistor in parallel. The current through the 9Ω resistor is labeled  $i_2$ . The third diagram shows the 120V source in series with the 4Ω resistor, which is then connected to a single 6Ω resistor. The current through the 4Ω resistor is labeled  $i_x$ . To the right of the diagrams are the following calculations:  
$$i_x = \frac{120 \text{ volt}}{6 + 4} = \underline{\underline{12 \text{ A}}}$$
$$V_1 = (12)(6) = 72 \text{ volt}$$
$$\boxed{V_1 = V_{xy}}$$
$$i_1 = \frac{V_1}{18} = \frac{72}{18} = \underline{\underline{4 \text{ A}}}$$
$$i_2 = \frac{V_1}{8} = \frac{72}{8} = \underline{\underline{8 \text{ A}}}$$

B)

