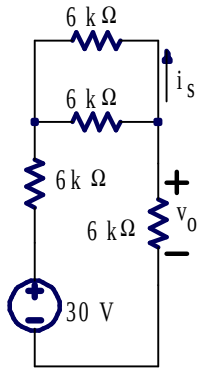
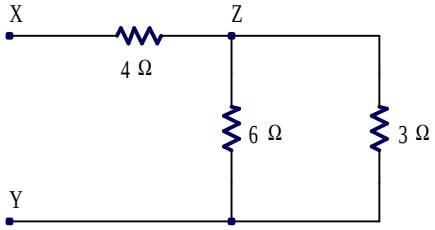
19.) Combine some resistors in series and/or parallel to find a single-loop circuit that is equivalent to the given circuit below with respect to finding v_o. Use the knowledge of v_o to find the currents through some of the resistors in the given circuit and ultimately, find i_s. (4/4 points)



The given circuit

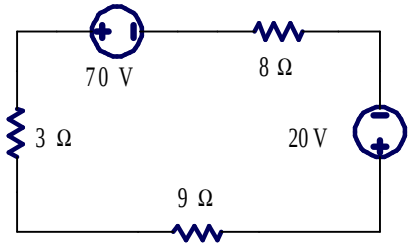
20.) An ohmmeter is an instrument for measuring electrical resistance directly in ohms. It has two probes. When each probe is attached to a different node in a circuit containing only resistors, the ohmmeter reads the resistance found between the two probes. In the circuit shown below what will an ohmmeter read if it is connected. . . (4/4 points)

a.) . . .to nodes X and Y and

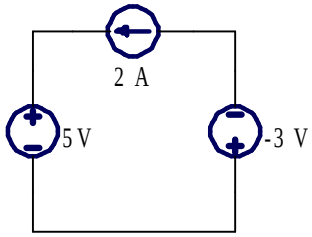


b) . . .to nodes Z and Y?

21.) Find the electrical power supplied to the circuit by the 20 V source. Explain what the sign of your answer means. (4/4 points)



22.) In the circuit diagram shown below, add current labels to each voltage source and voltage labels to each current source to conform with the passive sign convention. Then use KVL to quantify each of the newly labeled voltages and currents. Finally, find the electrical power dissipated by each circuit element and show that the sum of all the dissipated power is zero. (4/4 points)



As Given

23.) Find the electrical power supplied to the circuit by the 2 A source. Explain what the sign of your answer means. (4/4 points)