

Sample Quiz 6

Solutions

Problem 1. Resistive Network with 2 Loops and DC Sources

(a) The system in augmented matrix form is

$$\left(\begin{array}{ccc|c} 1 & -1 & -1 & 0 \\ 4 & 2 & 0 & 28 \\ 0 & 2 & -1 & 7 \end{array} \right)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & -1 & 0 \\ 0 & 6 & 4 & 28 \\ 0 & 2 & -1 & 7 \end{array} \right) \text{ Combo}(1,2,-4)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & -1 & 0 \\ 0 & 0 & 7 & 7 \\ 0 & 2 & -1 & 7 \end{array} \right) \text{ Combo}(3,2,-3)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & -1 & 0 \\ 0 & 2 & -1 & 7 \\ 0 & 0 & 7 & 7 \end{array} \right) \text{ Swap}(2,3)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & -1 & 0 \\ 0 & 2 & -1 & 7 \\ 0 & 0 & 1 & 1 \end{array} \right) \text{ mult}(3, 1/7)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & -1 & 0 \\ 0 & 2 & 0 & 8 \\ 0 & 0 & 1 & 1 \end{array} \right) \text{ Combo}(3,2,1)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & 0 & 1 \\ 0 & 2 & 0 & 8 \\ 0 & 0 & 1 & 1 \end{array} \right) \text{ Combo}(3,1,1)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & 0 & 1 \\ 0 & 1 & 0 & 4 \\ 0 & 0 & 1 & 1 \end{array} \right) \text{ mult}(2, 1/2)$$

$$\left(\begin{array}{ccc|c} 1 & 0 & 0 & 5 \\ 0 & 1 & 0 & 4 \\ 0 & 0 & 1 & 1 \end{array} \right) \text{ Combo}(2,1,1)$$

Last frame test passed ✓