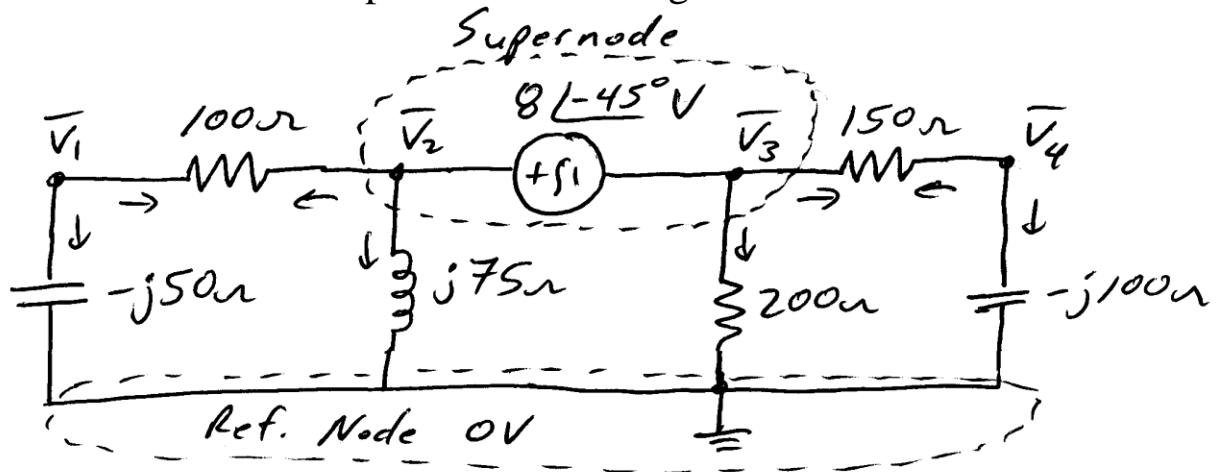


Ex. Determine the labeled phasor node voltages.



$$\text{Node 1: } \frac{\bar{V}_1 - 0}{-j50} + \frac{\bar{V}_1 - \bar{V}_2}{100} = 0$$

$$\text{Supernode: } \frac{\bar{V}_2 - \bar{V}_1}{100} + \frac{\bar{V}_2 - 0}{j75} + \frac{\bar{V}_3 - 0}{200} + \frac{\bar{V}_3 - \bar{V}_4}{150} = 0$$

$$\text{Aux. Eqn: } \bar{V}_2 - \bar{V}_3 = 8\angle-45^\circ$$

$$\text{Node 4: } \frac{\bar{V}_4 - \bar{V}_3}{150} + \frac{\bar{V}_4 - 0}{-j100} = 0$$

$$\left(\frac{1}{-j50} + \frac{1}{100}\right)\bar{V}_1 + \left(\frac{-1}{100}\right)\bar{V}_2 + (0)\bar{V}_3 + (0)\bar{V}_4 = 0$$

$$\left(\frac{-1}{100}\right)\bar{V}_1 + \left(\frac{1}{100} + \frac{1}{j75}\right)\bar{V}_2 + \left(\frac{1}{200} + \frac{1}{150}\right)\bar{V}_3 + \left(\frac{-1}{150}\right)\bar{V}_4 = 0$$

$$(0)\bar{V}_1 + (1)\bar{V}_2 + (-1)\bar{V}_3 + (0)\bar{V}_4 = 8\angle-45^\circ$$

$$(0)\bar{V}_1 + (0)\bar{V}_2 + \left(\frac{-1}{150}\right)\bar{V}_3 + \left(\frac{1}{150} + \frac{1}{-j100}\right)\bar{V}_4 = 0$$

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$$\bar{V}_1 = 0.6247 - j1.8284 = \underline{\underline{1.932\angle-71.14^\circ\text{ V}}}$$

$$\bar{V}_2 = 4.28155 - j0.57904 = \underline{\underline{4.321\angle-7.702^\circ\text{ V}}}$$

$$\bar{V}_3 = -1.3753 + j5.0778 = \underline{\underline{5.261\angle105.155^\circ\text{ V}}}$$

$$\bar{V}_4 = \underline{\underline{2.918\angle48.845^\circ\text{ V}}}$$