



$v1=120, v2=120i, v3=14.14213562+14.14213562i, v20+v3=v10, ((v10-v1)/2)+(v10/-5i)+(v20/4i)=0$

Input interpretation:

$$\left\{ \begin{aligned} v1 &= 120, v2 = 120i, v3 = 14.14213562 + 14.14213562i, \\ v20 + v3 &= v10, \frac{v10 - v1}{2} + -\frac{v10}{5}i + \frac{v20}{4}i + \frac{v20 - v2}{4} = 0 \end{aligned} \right\}$$

i is the imaginary unit »

Result:

$$\left\{ v1 = 120, v2 = 120i, v3 = 14.1421 + 14.1421i, v20 + v3 = v10, \frac{v10 - v1}{2} - \frac{i v10}{5} + \frac{v20 - v2}{4} + \frac{i v20}{4} = 0 \right\}$$

Alternate forms:

$$\left\{ \begin{aligned} v1 &= 120, v2 = 120i, v3 = 14.1421 + 14.1421i, \\ v10 &= v20 + v3, 10v1 - (10 - 4i)v10 + 5v2 - (5 + 5i)v20 = 0 \end{aligned} \right\}$$

$$\left\{ \begin{aligned} v1 &= 120, v2 = 120i, v3 = 14.1421 + 14.1421i, \\ v20 + v3 &= v10, \frac{1}{20}(-10v1 + (10 - 4i)v10 - 5v2 + (5 + 5i)v20) = 0 \end{aligned} \right\}$$

$$\left\{ v1 = 120, v2 = 120i, v3 = 14.1421 + 14.1421i, v3 = v10 - v20, \left(\frac{1}{4} + \frac{i}{4} \right) v20 = \frac{v1}{2} - \left(\frac{1}{2} - \frac{i}{5} \right) v10 + \frac{v2}{4} \right\}$$

Expanded form:

[Step-by-step solution](#)

$$\left\{ \begin{aligned} v1 &= 120, v2 = 120i, v3 = 14.1421 + 14.1421i, \\ v20 + v3 &= v10, -\frac{v1}{2} + \left(\frac{1}{2} - \frac{i}{5} \right) v10 - \frac{v2}{4} + \left(\frac{1}{4} + \frac{i}{4} \right) v20 = 0 \end{aligned} \right\}$$

Alternate form assuming $v1, v10, v2, v20$, and $v3$ are real:

$$\left\{ \begin{aligned} v1 &= 120, v2 = 120i, v3 = 14.1421 + 14.1421i, \\ v20 + v3 &= v10, -\frac{v1}{2} + i \left(\frac{v20}{4} - \frac{v10}{5} \right) + \frac{v10}{2} - \frac{v2}{4} + \frac{v20}{4} = 0 \end{aligned} \right\}$$

Complex solution:

[Step-by-step solution](#)

$$\begin{aligned} v1 &\approx 120. + 0.i, \quad v10 \approx 82.9266 + 43.8996i, \quad v2 \approx -5.68434 \times 10^{-14} + 120.i, \\ v20 &\approx 68.7845 + 29.7575i, \quad v3 \approx 14.1421 + 14.1421i \end{aligned}$$