In general for these problems determine the branch voltages and currents.

Solution using superposition: Solve the problem where the source voltage is to be calculated when the voltage across the 2.5Ω resistor is 1V. The current through this resistor then is 0.4A. The current through the parallel inductor then is 1/j = -jA. The current through the source therefore is 0.4 - j A. The source voltage then would have to be the 1V plus the drops across the series 5Ω resistor and -j2.5Ω capacitor, i.e., 1 + (0.4 - j)(5-j2.5) = 0.5 - j6V.

Now scale the calculated source voltage to 1V; multiply all voltages by 1/(0.5 - j6) = 0.166∠85.23°; this is the voltage across the 2.5Ω resistor when the source voltage is 1∠0°. The remaining branch voltages and currents follow directly.

Use node voltage 2 as a reference (see phasor diagram). Then the current through the inductor lags this voltage by 90°, and the voltage through the capacitor leads it by 90°. The current through the resistor is the sum of these currents. The voltage across the resistor is 4 times the current, and adding the phasor for the voltage across the resistor to the phasor for the node 2 voltage provides the source voltage. If we take the length of the V20 phasor to be 1 then the length of the current phasor through the inductor is 1/4 and that of the capacitor current phasor is 1/2. That makes the length of the voltage (phasor) across the resistor equal 1, so that the angle between V20 and V10 is 45°. Hence V10 = -√2. The length of V10 corresponds to 12 volts, so V20 is 6√2 volts. The source current is 1/4 of this.
Voltage Source Only:
\[ Y_0 = -\left(\frac{2}{2-j}\right)(-j) = 0.894 \angle 116.565^\circ \]

Current Source Only:
\[ Y_0 = 4 \left(\frac{1}{2-j}\right)(-j) = 1.789 \angle 63.435^\circ \]

Superposition:
\[ Y_0 = 4 \left(\frac{1}{2-j}\right)(-j) - \left(\frac{2}{2-j}\right)(-j) \]
\[ = 2 \left(\frac{1}{2-1}\right)(-j) = 0.894 \angle 63.435^\circ \]

Observe that \(12 = -4j\). Hence the II loop equation is
\[ 12 = 11(4-2j+2)+4j(-4j+2) \]
\[ 11 = (\frac{2+4j}{3-2j}) \]
\[ Y_0 = (11+4j)(-4j+2) \]
\[ = 4 \left(\frac{3+4j}{3-2j}\right) = 5.547 \angle 86.82^\circ \]

The various branch currents all can be expressed in terms of a single branch current, which is conveniently chosen to be that in the 1Ω resistor on the lower right. Then note that the voltage across the LC branch pair equals that across the two 1Ω resistors on the right, i.e.,
\[-(2-1)(1)+1(1) = (-j)(-1) + (4-1)(j).\]

Solve to determine that \(Y_0 = 1 = 1+j2\).

Using superposition: Set the 2A source strength to 0, and calculate the partial contribution to \(Y_0\) as \(4(1/3)1 = 4/3\) V. Then set the 4A source strength to 0, and calculate the partial contribution to \(Y_0\) as \(2(1/3)1 = 2/3\) V. Hence \(Y_0 = 2/3\) V.
\[ I = \frac{12 \left( \frac{1 - j}{2 - j} \right)}{2 + \frac{2 + j}{5}} = 60 \left( \frac{1 - j}{2 - j} \right) \frac{1}{12 + j} \]

\[ = 3.151 \angle -23.199 \]
To determine the Thevenin impedance set the current and voltage source strengths to 0, and determine the input impedance. By inspection this is

\[ Z_T = -j + 1 \| (1+j) = \frac{2-j}{2+j} \]

Determine the Thevenin (open-circuit) voltage using superposition.

\[ V_{oa} = \frac{6}{1+1+j} = \frac{6}{2+j} \]

\[ V_{ob} = 2\left(\frac{j}{1+1+j}\right) - 2j = -2j\left(\frac{1+j}{2+j}\right) \]

\[ V_{oc} = \frac{2j}{1+1+j} = \frac{2j}{2+j} \]

\[ V_T = \frac{6}{2+j} - 2j\left(\frac{1+j}{2+j}\right) + \frac{2j}{2+j} = \frac{6}{2+j} \]

\[ Z_T = \frac{2-j}{2+j} \]

\[ V_0 = \frac{V_T}{Z_T + 1} = 2^\circ \]