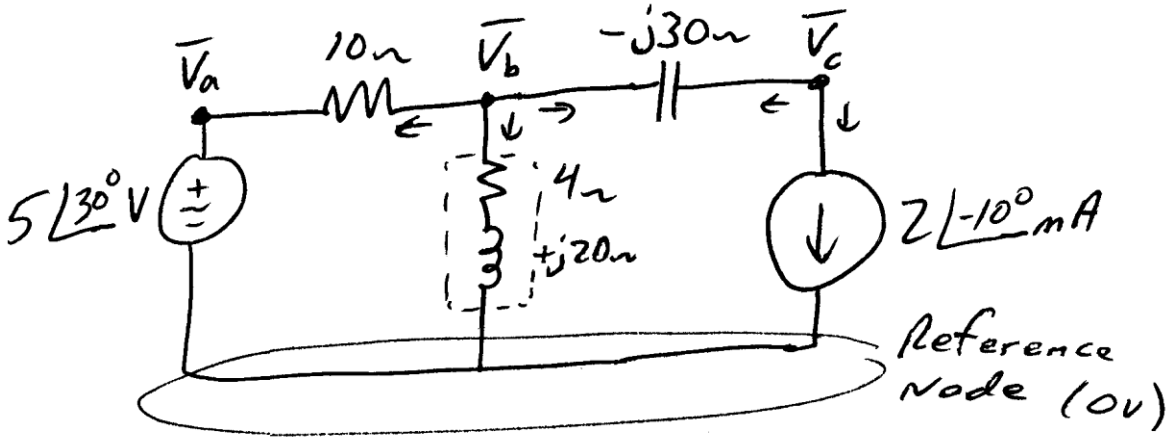
Ex. Determine the labeled phasor node voltages.



Node a: $\bar{V}_a = 5\angle 30^\circ V$

Node b: $\frac{\bar{V}_b - \bar{V}_a}{10} + \frac{\bar{V}_b - 0}{4+j20} + \frac{\bar{V}_b - \bar{V}_c}{-j30} = 0$

Node c: $\frac{\bar{V}_c - \bar{V}_b}{-j30} + 2\angle -10^\circ mA = 0$

$$\left(\frac{1}{10} + \frac{1}{4+j20} + \frac{1}{-j30}\right)\bar{V}_b + \left(\frac{-1}{-j30}\right)\bar{V}_c = \frac{5\angle 30^\circ}{10}$$

$$\left(\frac{-1}{-j30}\right)\bar{V}_b + \left(\frac{1}{-j30}\right)\bar{V}_c = -2\times 10^{-3}\angle -10^\circ$$

$\hookrightarrow \bar{V}_b = 2.4578 + j3.36186 V = 4.1645\angle 53.83^\circ V$

$\bar{V}_c = 2.4682 + j3.42095 = 4.2184\angle 54.190^\circ V$

Check $\frac{\bar{V}_b - \bar{V}_c}{-j30} = 2.00\angle -9.95^\circ mA$

$\simeq 2\angle -10^\circ mA$

Illustrates the need to carry more significant digits w/ complex #s