

$$5 + 5 = \frac{10}{10}$$

Name missing.

# ECS 303 - HW11

## Dr. Prapun Suksompong

### Chapter 10, Problem 7.

Use nodal analysis to find  $V$  in the circuit of Fig. 10.56

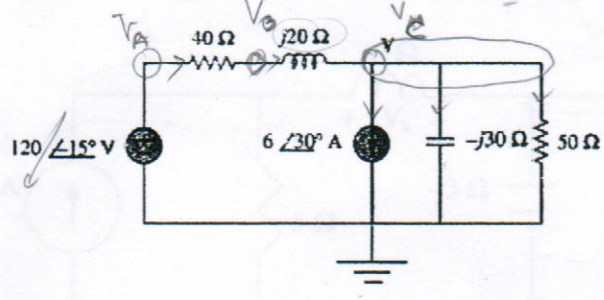


Figure 10.56

① Node A:

$$V_A = 120 \angle 15^\circ \text{ V}$$

② Node B: KCL + Ohm's law

$$\frac{V_A - V_B}{40} = \frac{V_B - V_C}{20j} \quad \text{--- (1)}$$

③ Node C: KCL + Ohm's law

$$\frac{V_B - V_C}{20j} = 6 \angle 30^\circ + \frac{V_C}{-30j} + \frac{V_C}{50} \quad \text{--- (2)}$$

From (1):

$$\frac{20j(115.91 - 31.06j)V_B}{2} = V_B - V_C$$

$$31.06 + 115.91j - V_B j = 2V_B - 2V_C \quad \text{--- (3)}$$

From (2):

$$15jV_B - 15jV_C + 10jV_C + 6V_C = -1560 - 900j \quad \text{--- (4)}$$

Sub (3) into (4):

$$115.91 + 31.06j - 2V_B + 2V_C = -1560 - 900j$$