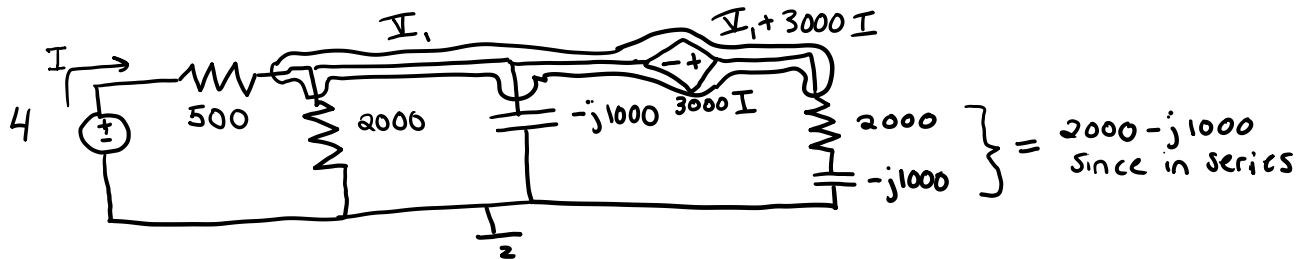


$$\frac{1}{5} \mu F \Rightarrow \frac{1}{j\omega C} = \frac{1}{j(5k)(\frac{1}{5} \mu)} = \frac{1}{j\mu} = -j1000$$



Just one unknown node:

$$\frac{V_1 - 4}{500} + \frac{V_1}{2000} + \frac{V_1}{-j1000} + \frac{V_1 + 3000I}{2000 - j1000} = 0$$

$$V_1 \left(\frac{1}{500} + \frac{1}{2000} - \frac{j}{1000} + \frac{1}{2000 - j1000} - \frac{6}{2000 - j1000} \right) = \frac{4}{500} - \frac{24}{2000 - j1000}$$

eg by TI-91, mode: degree, complex $\rightarrow$ polar, approx, $1/500 + 1/2000 - 1/(j1000) + \dots$

$$0.0005 V_1 = 0.0506 \angle -108.4^\circ$$

$$V_1 = 10.1 \angle -108^\circ$$

$$I = \frac{4 - V_1}{500} = 0.024 \angle 53.4^\circ$$

$$i(t) = 24 \cos(5000t + 53.4^\circ) \text{ mA}$$