Team Assignment 9, Mariano Murray, Saaif Ahmed

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$$\frac{V_a}{400} + \frac{V_s}{400} + V_a(j * 2000 * 1 * 10^{-6}) + \frac{V_a}{400} - \frac{V_b}{400} = 0$$

$$\frac{V_b}{400} - \frac{V_a}{400} + \frac{V_b}{j * 2000 * 0.3} + \frac{V_b}{800} = 0$$

$$V_b = \frac{V_a}{400} \div \left(\frac{1}{400} + \frac{1}{600j} + \frac{1}{800}\right) = \frac{54 * V_a}{97} + \frac{24 * V_a * j}{97}$$

substituting in and simplifying

$$\frac{2V_a}{400} + 0.002jV_a - \frac{3V_a}{200(9 - 4j)} - \frac{1}{20} = 0$$

$$V_a\left(\frac{2}{400} + 0.002j - \frac{3}{200(9 - 4j)}\right) = \frac{1}{20}$$

$$V_a = \frac{1}{20} \div \left(\frac{7}{1940} + 0.00138j\right)$$

$$V_a = V_C = 12.08 - 4.62j$$