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EE 291
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Project 1: MATLAB

Part 1:

Initial Equations

$Z = R_1 \,||\, R_2 + ZL \,||\, ZC$ $\qquad R_1||R_2 = \frac{1}{\frac{1}{R1}+\frac{1}{R2}}$ $\qquad ZL \,||\, ZC = \frac{ZL*ZC}{ZL+ZC}$

Substitute Values

$$150 = \frac{1}{\frac{1}{150}+\frac{1}{300}} + \frac{0.5\omega*\frac{1}{0.6*10^{-6}\omega}}{0.5\omega+\frac{1}{0.6*10^{-6}\omega}} \qquad 0 = \frac{0.5\omega*\frac{1}{0.6*10^{-6}\omega}}{0.5\omega+\frac{1}{0.6*10^{-6}\omega}} - 50$$

Using MATLAB Simplify $\qquad 0 = \frac{-(50*(3\omega^2 - 10^5\omega + 10^7))}{3\omega^2 + 10^7}$

Part 2: Solving with Bisection and Regula-Falsi

Final Solution:

ω = 99.5342

Number of Iterations:

I = 19

Absolute relative approximate error:

Error = 0.0098

Part 3: Solving with Newton's Method

Final Solution:

ω = 100.3018

Number of Iterations:

$I = 3$

Absolute Relative Error:

$Error = 0.0027$