

ECE 320 - Homework #1

Matlab, PartSim, Solving $f(x) = 0$. Due Monday, August 29th

- 1) Given 2 equations with 2 unknowns

$$V = 10 - 1000I$$

$$V = 0.052 \cdot \ln(10^7 \cdot I + 1)$$

- 1a) Solve in Matlab using graphical methods

- 1b) Solve numerically to find V and I

- 2) Given 2 equations with 2 unknowns

$$V = 10 - 1000I$$

$$I = 0.1 \cdot (V - 2)^2$$

- 2a) Solve in Matlab using graphical methods

- 2b) Solve numerically to find V and I

- 3) Solve using *fminsearch()* in Matlab

$$\left(\frac{V_1 - 10}{100} \right) + \left(\frac{V_1 - V_2}{200} \right) + \left(\frac{V_1}{300} \right) + I_{d1} = 0$$

$$I_{d1} + \left(\frac{V_1 - V_2}{200} \right) = I_{d2}$$

$$I_{d1} = 10^{-7} \cdot (e^{20(V_1 - V_2)} - 1)$$

$$I_{d2} = 10^{-7} \cdot (e^{20V_2} - 1)$$

- 4) Input this circuit into PartSim to solve for the node voltages

