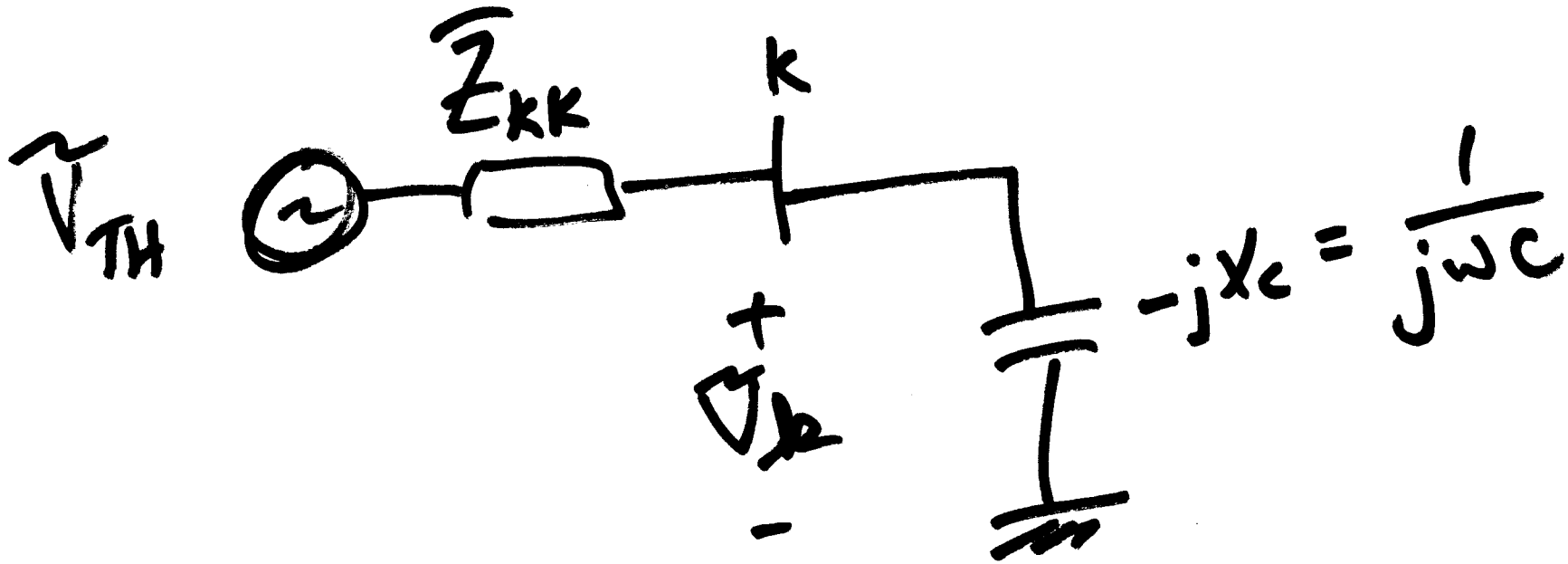
EE 5200 - Lecture 36 **Friday Nov 20, 2009**

Topics for Today:

- Announcements
  - Software: online students - apply for ATP/ATPDraw license, verify licensing when you receive it by e-mail, and we will mail you the install CD.
  - ASPEN software - run off of MTU server via internet, see e-mail instructions.
  - Office: EERC 614. Phone: 906.487.2857
  - Recommended problems & all solutions: Ch.13 solns now posted.

Ongoing topics...

- Chapter 13 - Power system operation, AGC, economic dispatch
  - Constrained optimization methods - LaGrange multipliers
  - Optimal Dispatch, Generator Scheduling
    - Economics
    - Other constraints - environmental, contractual, availability
    - System load characteristics
  - Application to lossless system
  - System including losses - use [B] loss coefficient matrix



$$\tilde{V}_K = \left| \tilde{V}_{TH} \frac{-jX_C}{\bar{Z}_{KK} + (-jX_C)} \right| = 1.03$$

$\uparrow$

0.68

Loadflow

- "Flat" Start vs. "hot" start

Key: Must give initial values to V, δ.

Slack Bus: V is fixed; $\delta = 0°$

PV Bus: V is " ; δ = ___ ?

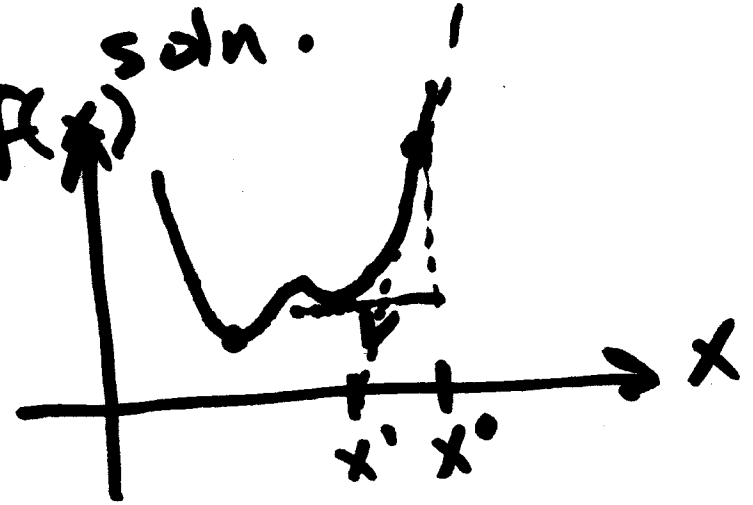
PQ Bus: V = ___ ? ; δ = ___ ?

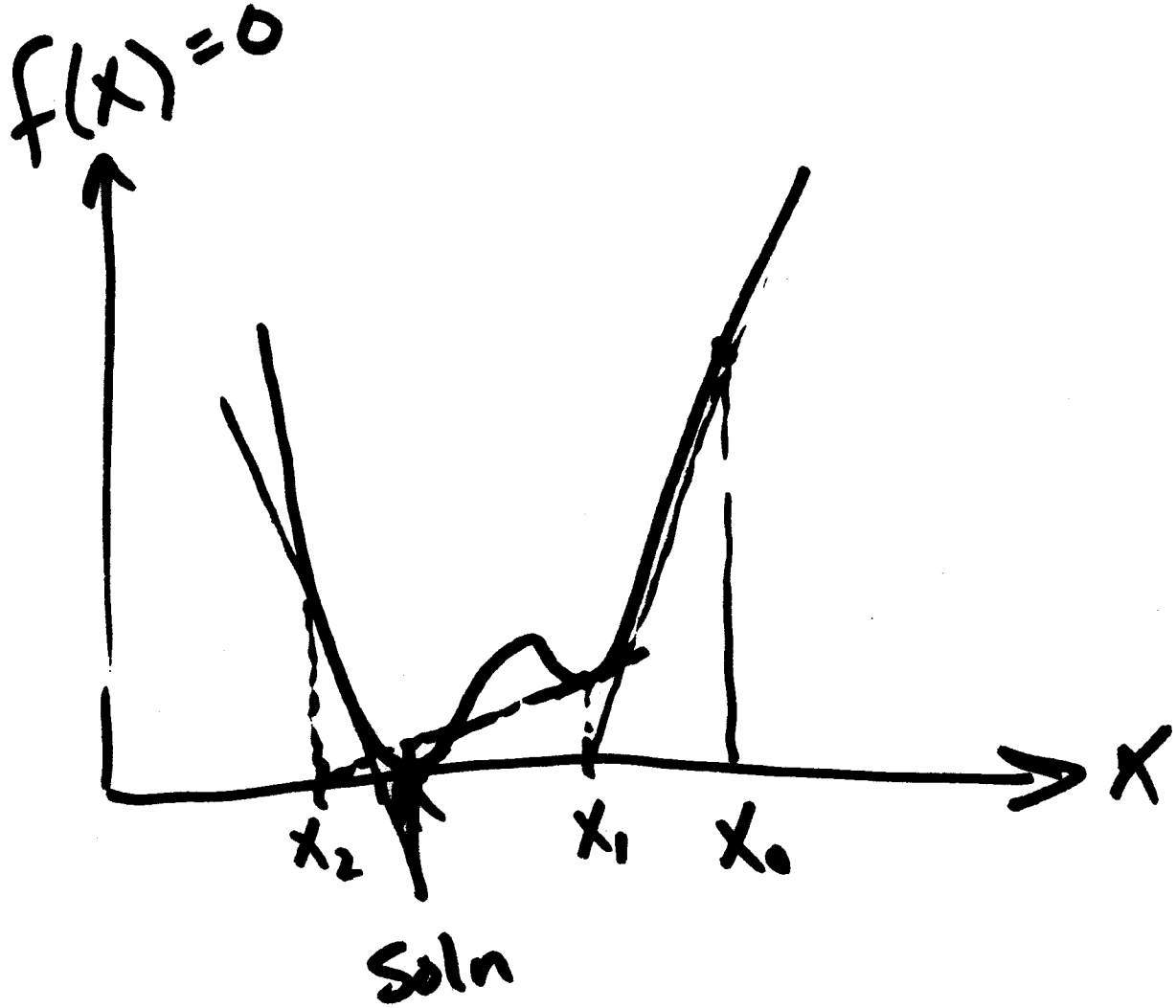
At PV Bus: $\delta = 0°$ (flat start)
PQ " : V = 1.0 p.u. "
PQ " : $\delta = 0°$ "

Hot Start: Use δ & V values from a similar converged case.

Is convergence guaranteed?

No! Nonlinear system of eqns. NR uses first-order (i.e. LINEAR) approximation at each iteration to move toward the soln.





Risk: - May converge to local soln, not global soln.
- May "blow up" F.P. overflow.