

ECON 5760
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Problem Set 4

Problem 1. For this problem you are to write a script (m-file) called NR.m that is capable of implementing the Newton-Raphson method for solving a general system of equations for which $\mathbf{f}(\mathbf{x}) = \mathbf{0}$. This function should be able to take as an input a general system of equations and an initial guess of \mathbf{x}_0 .¹

a. Using your function above, find the solution to the following system of equations for an arbitrary q :

$$\begin{array}{rcl} \frac{1}{k_t^\alpha - k_{t+1}} & = & \frac{\alpha \beta k_{t+1}^{\alpha-1}}{k_{t+1}^\alpha - k_{t+2}} \\ \frac{1}{k_{t+1}^\alpha - k_{t+2}} & = & \frac{\alpha \beta k_{t+2}^{\alpha-1}}{k_{t+2}^\alpha - k_{t+3}} \\ \cdot & = & \cdot \\ \cdot & = & \cdot \\ \cdot & = & \cdot \\ \frac{1}{k_{t+q-2}^\alpha - k_{t+q-1}} & = & \frac{\alpha \beta k_{t+q-1}^{\alpha-1}}{k_{t+q-1}^\alpha - k_{t+q}} \end{array}$$

b. Plot the true solution and the approximate solution on the same graph and label your graph appropriately.

¹You will also need the eulereq.m and CDJac.m files to complete the assignment. Be sure your dimensions are appropriately defined.