

Homework #3
Mathematical Methods II
Spring 2009

1. Consider the deterministic growth model with elastic labor supply. The allocation for this economy is the one chosen by a social planner who solves the dynamic program

$$v(k) = \max_{c \geq 0, k' \geq 0, h \in [0,1]} \left\{ \frac{c^{1-\sigma}}{1-\sigma} + \nu \frac{(1-h)^{1-\gamma}}{1-\gamma} + \beta v(k') \right\}$$

subject to

$$c + k' \leq k^\alpha h^{1-\alpha} + (1-\delta)k.$$

Set $\alpha = 0.36$, $\beta = 0.99$, $\delta = 0.025$, $\nu = 2.0$, $\sigma = 2.0$, and $\gamma = 5.0$.

- (a) Find the steady state values (k^*, h^*, c^*) .
- (b) For each pair (k, k') , write a function file that can be used to compute (c, h) . Some notes on the website will help you with the syntax here.
- (c) Embed your program from b) into a discrete state space dynamic program that solves for $v(k)$ on a grid of 1000 points that spans from 20 percent to 200 percent of the steady state.