1. Precisely state the Phelps-Koopmans Theorem on dynamic inefficiency. Carefully prove the theorem.

2. Burdens of the debt:

$$Y = 100K^{0.7}L^{0.3}$$
$$Y = C + Z$$
$$y = 100k^{b.7} = c + z$$

Perceived income per worker is $$\bar{y} = y + \delta$$, where $$\delta$$ is lump-sum transfers per head = deficit per head. Depreciation $$\mu = 0.2$$, Population growth $$n = 0.01$$.

a. Plot steady-state capital intensity $$k$$ against steady-state debt per head $$\Delta$$. Show that $$k(\Delta)$$ is not necessarily unique.

b. Plot $$c$$ against steady-state $$\Delta$$.

c. Calculate the $$\Delta$$ consistent with golden-rule $$k$$. Show that at the GR wealth per head $$(k + \Delta)$$ is maximized and hence $$\Delta$$ equally crowds out $$k$$ at margin.

d. Calculate the maximum sustainable debt per head and the corresponding $$k$$.

e. Show that if $$\delta$$ is constant then the steady state is stable if and only if $$dk/d\Delta < 0$$.