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ECO325F: Advanced Economic Theory-Macro

Problem Set #4

1. Romer 2.10 (old edition of Romer 2.9)
2. Romer 2.13 (old edition of Romer 2.12)
3. Romer 2.14 (old edition of Romer 2.13)
4. Prove that when the household's lifetime utility is

$$U = B \int_{t=0}^{\infty} e^{-\beta t} \frac{(c(t))^{1-\theta}}{1-\theta} dt + B_1 \int_{t=0}^{\infty} e^{-\beta_1 t} V(G_t) dt$$

where $\beta = \rho - n - (1 - \theta)g > 0$, $B = \frac{A(0)^{1-\theta} L(0)}{H}$, and B_1 and β_1 are positive constants and $B_1 \int_{t=0}^{\infty} e^{-\beta_1 t} V(G_t) dt < \infty$, and the budget constraint is given by equation (2.41) in Romer, then

$$\frac{\dot{c}(t)}{c(t)} = \frac{f'(k(t)) - \rho - \theta g}{\theta}$$