HOMEWORK 3

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Question 1.
The recursive problem is

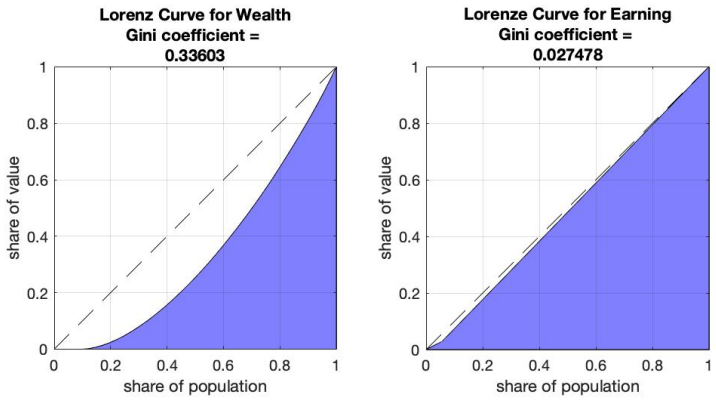
$$v(s,\, a) = \max_{a' \in \Gamma(s,\, a)} \left\{ \frac{(y(s) + a - a'q)^{1-\sigma}}{1-\sigma} + \beta \mathbb{E}_{s'|s}[v(s',\, a')] \right\}$$

where s, a are state variables and a' is the control variable. State space can be described as $s = \{employed\,(e),\, unemployed\,(u)\}$
Note that $\Gamma(s,\, a) = \left\{ a' : \underline{a} < a' < \frac{y(s)+a}{q} \right\}$.

Question 2.
The risk-free interet rate in the economy in steady-state is

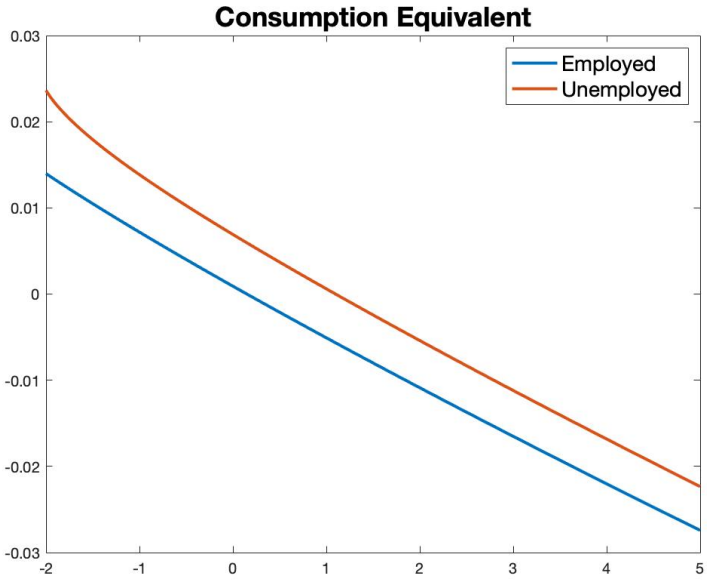
$$r* = \frac{1}{q} - 1 = \frac{1}{0.9951} - 1 = 0.49\%$$

Question 3.
The Lorenz Curve for wealth and earnings are shown below:



Question 4.
If everyone started out with zero assets and there was perfect insurance against all income shocks, people will smooth their consumption throughout the whole period. In this case, the expected utility of the allocation is

$$W^{FB} = \frac{\bar{c}^{1-\sigma}}{1-\sigma} / 1 - \beta = -338.15$$



55.40% of households would benefit from the plan, and the aggregate welfare gain is 0.0014.