

# ECON 2456 Midterm Exam

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March 1, 2012

1. (55 pts.) The citizens of the Free Republic of Egal live in five households, each with an annual income of \$2. The citizens of the neighboring Kingdom of You live in five households, with annual incomes of \$3, \$3, \$3, \$3, and \$88. (You can assume that \$1 has the same spending power in Egal and You.)
  - (a) Which country is better off according to a Rawlsian social welfare function? Which is better off according to a utilitarian SWF? Explain your answers briefly.
  - (b) Draw the Lorenz curves for Egal and You. Comparing these two curves, in which country is the distribution of household income more equal? Explain briefly.
  - (c) Calculate the Gini coefficients for Egal and You. Comparing these two statistics, in which country is the distribution of household income more equal? Explain briefly.
  - (d) Consider the social welfare function

$$W = (1/n) \sum_{i=1}^n (y_i - (|y_i - \bar{y}|)^2)$$

where  $\bar{y}$  is mean income,  $y_i$  is household  $i$ 's income, and there are  $n$  households. Which country is better off according to this SWF? How do the values implied by this SWF differ from those of the Rawlsian and utilitarian SWFs?

2. (25 pts.) Explain the difference between an *absolute poverty measure* and a *relative poverty measure*. Which type of measure is the official US poverty threshold?
3. (20 pts.) Alice and Bob are two (economically-speaking) identical friends who, completely by chance, embark on two different career paths. Alice graduates high school at 18 and begins work as a plumber, earning \$40,000 per year. Bob enrolls in college, for which he pays \$20,000 per year in tuition and fees. When he graduates at age 22, Bob begins work as a computer programmer, earning \$60,000 per year. Alice and Bob both plan to retire at age 67. Assume, for simplicity, that there's no inflation; that the real interest rate is  $r$  every year; that they both pay no taxes; etc. How would you figure out whether Bob's investment in college was worthwhile? Be as detailed as possible, i.e. write some mathematical expressions, but it is not necessary to actually compute an answer.