Problems 1 and 2 are designed to review basic supply and demand analysis.

Suppose that aggregate demand is described by

\[ Y^D = \alpha + \beta P, \quad \alpha > 0, \quad \beta \leq 0 \]

and aggregate supply is described by

\[ Y^S = \gamma + \delta P, \quad \gamma > 0, \quad \delta \geq 0 \]

1. Calculate equilibrium output and price in terms of \( \alpha, \beta, \gamma, \) and \( \delta \)

2. Suppose that \( \alpha \) is increased to \( \alpha + 1 \). Calculate the effect on equilibrium output and price. Does the magnitude of the output effect (i.e. the change in \( Y \) when \( \alpha \) is increased to \( \alpha + 1 \)) increase or decrease with \( \delta \)? What is the economic intuition for this?

Problems 3 and 4 are based on the two-period consumption problem described in lecture notes #3. Assume that the real interest rate \( r \) is known with certainty.

3. Is it possible for an increase in the real interest rate from \( \overline{r} \) to \( \underline{r} \) will raise consumption in time 0? Explain.

4. Suppose that preferences are represented by \( U(C_0, C_1) = C_o + 0.9 C_1 \) Assuming that an individual receives income \( Y \) when young, express the shares of income that are consumed and saved when young as functions of the real interest rate. Interpret your answer in the context of the functional form assumed for utility.