Intermediate Microeconomics - Spring 2016

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Homework 4

Due Wednesday 24th February

Question 1 (Edgeworth Box and Equilibrium) Geoff (consumer 1) and Stelling (consumer 2) live on a desert island. The only goods on the island are cod (c) and tanning oil (t). Geoff's initial endowment is $w_c^1 = 5$ and $w_t^1 = 1$. Stelling's initial endowment is $w_c^2 = 7$ and $w_t^2 = 6$

1. Draw the Edgeworth box for this economy, along with the point that indicates the initial endowment of Geoff and Stelling
2. Draw the budget sets for both Geoff and Stelling if $p_c = 2$ (normalizing the price of tanning oil to 1)
3. Assume that Geoff has preferences given by $u^1(x_c^1, x_t^1) = x_c^1 x_t^1$ and Stelling has preferences given by $u^2(x_c^2, x_t^2) = \left(x_c^2\right)^2 x_t^2$. Solve the consumer problems for Geoff and Stelling when $p_c = 2$. Illustrate their optimal bundles in your Edgeworth box diagram.
4. Can the economy be in equilibrium when $p_c = 1$? Explain why or why not.
5. If you think $p_c = 1$ cannot support an equilibrium, calculate the equilibrium prices and demands for the economy. Illustrate them in the Edgeworth box
6. Let p_c^* be the equilibrium price that you calculated in part 5. show that the economy would also be in equilibrium if the price of cod was $2p_c^*$, while the price of tanning oil was 2
7. Rather than assuming we know the initial endowments of each person, calculate the equilibrium price as a function of w_c^1, w_t^1, w_c^2, w_t^2

8. Does p_c increase or decrease as the **total** amount of cod in the economy increases (i.e. $w_c^1 + w_c^2$). Is the effect different depending on who gets the cod? (i.e. does a change in w_c^1 have a different impact on equilibrium prices than w_c^2)? If so, why do you think this is?

9. **(HARD - so you have to think!).** What would the equilibrium prices and quantities be if the preferences for Geoff and Stelling were given by $u^1(x_c^1, x_t^1) = \min\left\{x_c^1, x_t^1\right\}$ and $u^1(x_c^2, x_t^2) = \min\left\{x_c^2, x_t^2\right\}$