

Microeconomics — Homework #1 (Due 9 Sep 2014)

1. Ana and Bob both like bananas. Their (inverse) demand curves are  $Q_a = 10 - p$  and  $Q_b = 8 - 2p$ , respectively.
  - (a) Calculate their quantity demanded for bananas at  $p = 2$ .
  - (b) Draw each of their inverse demand curves on one set of axes ( $p$  on the vertical axis). Show the quantity of bananas both consume.
  - (c) Now draw their aggregate (inverse) demand curve and show their total quantity demanded, given  $p = 2$
  - (d) You are a banana seller and observe Ana and Bob's banana purchases. Do you know if Ana or Bob likes bananas more? Explain.
  
2. David Ricardo described “comparative advantage” in 1817, i.e., the potential for both sides to benefit from trade, even if one side is worse at producing both goods. We will use this idea here.
  - (a) You are stranded on a desert island, where you can catch 2 fish per hour or harvest 5 coconuts per hour. Under the tropical sun, you can only work 5 hours per day. Draw your “production potential” for fish (vertical axis) and coconuts (horizontal axis).
  - (b) You like fish more than coconuts but always some of each, i.e,  $u(f, c) = f^{\frac{2}{3}}c^{\frac{1}{3}}$ . Use the Lagrangian method to calculate your utility maximizing consumption on a normal day. Show all your steps AND double check that your final consumption exhausts your time (budget constraint).
  - (c) One day, you meet Max, a friendly guy who is also stranded on the island. He is better at harvesting both fish and coconuts (at a rate of 3 and 12 per hour, respectively). Max offers to trade 10 coconuts for 3 of your fish (only once). How many fish and coconuts will you have before and after trading? Explain, using utility, if you should trade with Max.
  - (d) How is it possible that Max can benefit from trading with you when he's better at harvesting BOTH fish and coconuts? Explain using the concept of “opportunity cost.”