Microeconomics. Problem set 1. Due date: tutorials till Dec, 14th.

Problem 1 (1.5p) *Much of the demand for U.S. agricultural output has come from other countries. In 1998 the total demand for wheat was $Q = 3244 - 283P$. Of this the total domestic demand was $Q_D = 1700 - 107P$, and domestic supply $Q_S = 1944 + 207P$. Suppose the export demand for wheat falls by 40%.*

- *US farmers are concerned about this drop in export demand. What happens to the free-market price of wheat in the US. Do farmers have much reasons to worry?[0.5p]*

- *Now suppose the US government wants to buy enough wheat to raise the price to 3.50$ per bushel. Whit the drop in export demand, how much wheat would the government have to buy? How much would this cost the government.[1p]*

Problem 2 (1.5p) *Tale below shows the retails price and sales for instant coffee and roasted coffee for 2007 and 2008.*

Year	2007	2008
instant coffee price	10.35	10.48
instant coffee sales	75	70
roasted coffee price	4.11	3.76
roasted coffee sales	820	850

- *Using this data alone, estimate the short-run price elasticity of demand for roasted coffee. Derive a linear demand curve for roasted coffee[1p]*

- *Repeat the calculations for instant coffee[1p]*

- *Which coffee has higher short-run price elasticity. Why?[1p]*

Problem 3 (2p) *In 1998 Americans smoked 470 billion cigarettes, or 23.5 billion of packs of cigarettes. The average retail price was $2 per pack. Statistical studies have shown that the price elasticity of supply is 0.5 and demand is -0.4. Using this information, derive linear demand and supply curves for the cigarette market.*

Problem 4 (2p) *Draw indifference curves that represent the following individuals' preferences for hamburgers and soft drinks. Indicate the direction in which the individuals' satisfaction (utility) is increasing.*

- *Joe has convex indifferent curves and dislikes both hamburgers and soft drinks.[0.5p]*

- *Jane loves hamburgers and dislikes soft drinks.[0.5p]*

- *Bill likes hamburgers but neither likes nor dislikes soft drinks.[0.5p]*

- *Molly loves hamburgers and soft drinks but insists on consuming exactly one soft drink for every two hamburgers that she eats.[0.5p]*

Problem 5 (0.5p) *If Jane is currently willing to trade 4 movie tickets for 1 basketball ticket, then she must like basketball better than movies. True or false? Explain.*

Problem 6 (2p) *Prices of two goods are $(p_1, p_2) = (1, 2)$ while demand $(d_1, d_2) = (1, 2)$. Suppose now prices have changed to $(p'_1, p'_2) = (2, 1)$ while demand to $(d'_1, d'_2) = (2, 1)$. Is this consistent with utility maximization? (hint: use reveled preferences analysis).*

Problem 7 (1.5p) *Consider a Constant elasticity of Substitution utility function $u(x, y) = [x^\rho + y^\rho]^{1/\rho}$ with $\rho \in (-\infty, 1]$. Does this utility exhibit the property of diminishing $MRS_{x,y}$?*

Problem 8 (1p) *Utility function is $U(x, y) = x^2 + y^2$. The marginal utilities are $MU_x = 2x$ and $MU_y = 2y$.*

- *Does the marginal utilities of x diminish, remain constant or increase as the consumer buys more x? [0.5]*

- *What is $MRS_{x,y}$ [0.5]*

- *Is $MRS_{x,y}$ diminishing, constant or increasing as the customer substitutes x for y along the indifference curves?[0.5]*

- *Draw few typical indifference curves for different utility levels.[0.5]*