Problem set 3

"due" 10/14/09

Problem 1 Suppose that good A is an inferior good and good B is a normal good, and that the consumer spends all of his money on these two goods.

a. If the price of good A rises, what will happen to the consumer's demand for Good A? Explain briefly in terms of income and substitution effects.

b. If the price of good B rises, what will happen to the consumer's demand for good A? Explain briefly in terms of income and substitution effects.

c. Are these goods complements of substitutes? Explain.

Problem 2 Derive and plot Olivia's demand curve for pie if she eats pie only a la mode and does not eat either pie or ice cream alon (so that pie and ice cream are perfect complements).

Problem 3 Caliban allocates \$240 to clothes (C) and food (F). He has utility function $u(C, F) = CF^3$ (so that $MU_C = F^3$ and $MU_F = 3CF^2$). The price of clothing is p_C, while the price of food is p_F.

a. Derive Caliban's demand function for food.

b. How much food does Caliban consume if $p_f = \$6$ and $p_c = \$15$? What if $p_f = \$12$ and $p_c = \$22$?

Problem 4 Each week, Bill and Jane select the quantity of two goods, A and B, that they will consume in order to maximize their respective utilities. They each spend their entire weekly income on these two goods.

a. Suppose you are given the following information about the choices that Bill makes over a three-week period:

	A	B	p_A	p_B	Income
Week 1	10	20	2	1	40
Week 2	7	19	3	1	40
Week 3	8	31	3	1	55

Did Bill's utility increase or decrease between week 1 and week 2? Between week 1 and week 3? Explain using a graph to support your answer.

b. Now suppose you are given the following information about Jane's choices:

	A	B	p_A	p_B	Income
Week 1	12	24	2	1	48
Week 2	16	32	1	1	48
Week 3	12	24	1	1	36

Draw a budget line-indifference curve graph that illustrates Jane's three chosen bundles. Are these goods complements or substitutes for Jane? Identify the income and substitution effects that result from a change in the price of good A.

Problem 5 Suppose the market for lawn gnomes is described by demand curve $q_g^d = 440 - 10p$ and supply curve $q_g^s = p$. Suppose also that the market for cigarettes is described by demand $q_c^d = 44 - \frac{1}{10}p$ and supply $q_c^s = p$.

a. Show that both markets have equilibrium quantity $q^* = 40$ and $p^* = 100$.

b. Evaluate the effect of a tax of \$10 on consumers in each market. Calculate consumers' surplus, producers' surplus, and government revenue before and after in each.

c. Which market has the higher deadweight loss of the tax? Explain why this is so, intuitively.

Problem 6 Suppose that the supply for corn is given by $q = 2p$ while the supply is given by $q = 210 - p$. Suppose that the government institutes a price floor of \$100 in this market, and supports it by purchasing the excess of supply over demand at that price. Suppose that the government is able to sell this excess corn in the third world for \$20/unit. Calculate the deadweight loss of this price floor, making sure to take into account the cost to the government.