Problem set 2, due Monday, 9/30/13

1. Excludable public good / natural monopoly – non-rival but excludable. The town of Blacksburg wants to build a wax sculpture museum, to benefit mankind. The fixed cost of building the museum is $7,000, but once it is built, the marginal cost of an extra visit is zero. Demand for museum visits is given by the marginal benefit function $MB = 80 - \frac{1}{10}q$, where q is the number of visits.

a) If the museum is run as a profit-maximizing, monopolistic company, what will it charge museum-goers for each visit? $p_m^* =$_____ At this price, there will be $q_m^* =$_____ visits, consumer surplus will be $CS_m^* =$_____, producer surplus will be $PS_m^* =$_____, and total economic surplus will be $TES_m^* =$_____.

b) Suppose that the government lets everyone into the museum for free, and finances the building cost using tax revenue. The number of museum visits will be $q_{mcp}^* =$_____, and consumer surplus will be $CS_{mcp}^* =$_____. If there is no deadweight loss associated with raising the extra tax revenue, then total economic surplus is $TES_{mcp,1}^* =$_____.

On the other hand, if each dollar of tax revenue used to finance the museum causes 50¢ of deadweight loss, then the total economic surplus generated by the museum project, net of this deadweight loss, is $TES_{mcp,2}^* =$_____.

c) What if, instead of financing the museum with tax revenue, the government decides to charge an admission price equal to average cost (F/q). The Pareto-dominant market-clearing quantity that satisfies this constraint is $q_{acp}^* =$_____, and the corresponding market price is $p_{acp}^* =$_____. The resulting consumer surplus is $CS_{acp}^* =$_____, the producer surplus is $PS_{acp}^* =$_____, and the total economic surplus is $TES_{acp}^* =$_____.

2. Clarke tax. There are five individuals who wish to use a Clarke voting mechanism to chose among three options: A, B, and C. Sincere utilities (in dollar amounts) for the different options are given in the first table below. Assuming that everyone votes these sincere utilities, which option will be chosen? _____ Use the table in the middle as an intermediate step toward filling in the tax table on the right.

	A	B	C
1	10	5	0
2	8	4	0
3	0	9	4
4	0	8	3
5	10	0	20

	A	B	C
1			
2			
3			
4			
5			

	Tax
1	
2	
3	
4	
5	

Explain how voters 3 and 4 can game the system, if the remaining voters express their sincere preferences.