PROBLEMS (Go ahead and write on another piece of paper):

Chap 7:
6. a. The effect of falling production costs in the market for stereos results in a shift to the right in the supply curve, as shown in Figure 11. As a result, the equilibrium price of stereos declines and the equilibrium quantity increases.

   b. The decline in the price of stereos increases consumer surplus from area A to A + B + C + D, an increase in the amount B + C + D. Prior to the shift in supply, producer surplus was areas B + E (the area above the supply curve and below the price). After the shift in supply, producer surplus is areas E + F + G. So producer surplus changes by the amount F + G – B, which may be positive or negative. The increase in quantity increases producer surplus, while the decline in the price reduces producer surplus. Since consumer surplus rises by B + C + D and producer surplus rises by F + G – B, total surplus rises by C + D + F + G.

   c. If the supply of stereos is very elastic, then the shift of the supply curve benefits consumers most. To take the most dramatic case, suppose the supply curve were horizontal, as shown in Figure 12. Then there is no producer surplus at all. Consumers capture all the benefits of falling production costs, with consumer surplus rising from area A to area A + B.

![Figure 11](image-url)
10. a. Figure 18 illustrates the effect of the drought. The supply curve shifts to the left, leading to a rise in the equilibrium price from $P_1$ to $P_2$ and a decline in the equilibrium quantity from $Q_1$ to $Q_2$.

b. If the price of water is not allowed to change, there will be a shortage of water, with the shortage shown on the figure as the difference between $Q_1$ and $Q_3$. 

2) p.157, Problems and Applications, Q10
c. The system for allocating water is inefficient because it no longer allocates water to those who value it most highly. Some people who value water at more than its cost of production will be unable to obtain it, so society’s total surplus is not maximized.

The allocation system seems unfair as well. Water is allocated simply on past usage, rewarding past wastefulness. If a family’s demand for water increases, say because of an increase in family size, the policy doesn’t allow them to obtain more water. Poor families, who probably used water mostly for necessary uses like drinking, would suffer more than wealthier families who would have to cut back only on luxury uses of water like operating backyard fountains and pools. However, the policy also keeps the price of water lower, which benefits poor families, since otherwise more of their family budget would have to go for water.

d. If the city allowed the price of water to rise to its equilibrium price \( P_2 \), the allocation would be more efficient. Quantity supplied would equal quantity demanded and there would be no shortage. Total surplus would be maximized.

Whether the market allocation would be more or less fair than the proportionate reduction in water under the old policy is difficult to say, but it is likely to be fair. Notice that the quantity supplied would be higher \( (Q_2) \) in this case than under the water restrictions \( (Q_1) \), so there is less reduction in water usage. To make the market solution even more fair, the government could provide increased tax relief or welfare payments for poor families who suffer from paying the higher water prices.

Chap 8:
3) p. 172, Problems and Applications, Q1

1. a. Figure 3 illustrates the market for pizza. The equilibrium price is \( P_1 \), the equilibrium quantity is \( Q_1 \), consumer surplus is area A+B+C, and producer surplus is area D+E+F. There is no deadweight loss, as all the potential gains from trade are realized; total surplus is the entire area between the demand and supply curves—A+B+C+D+E+F.

![Figure 3](image)

b. With a $1 tax on each pizza sold, the price paid by buyers, \( P_B \), is now higher than the price received by sellers, \( P_S \), where \( P_B = P_S + $1 \). The quantity declines to \( Q_2 \), consumer surplus is area A, producer surplus is area F, government revenue is area B+D, and
deadweight loss is area C+E. Consumer surplus declines by B+C, producer surplus declines by D+E, government revenue increases by B+D, and deadweight loss increases by C+E.

c. If the tax were removed and consumers and producers voluntarily transferred B+D to the government to make up for the lost tax revenue, then everyone would be better off than without the tax. The equilibrium quantity would be \(Q_1\), as in the case without the tax, and the equilibrium price would be \(P_1\). Consumer surplus would be A+C, because consumers get surplus of A+B+C, then voluntarily transfer B to the government. Producer surplus would be E+F, since producers get surplus of D+E+F, then voluntarily transfer D to the government. Both consumers and producers are better off than the case when the tax was imposed. If consumers and producers gave a little bit more than B+D to the government, then all three parties, including the government, would be better off. This illustrates the inefficiency of taxation.

4) p. 173, Problems and Applications, Q5

5. a. The deadweight loss from a tax on heating oil is likely to be greater in the fifth year after it is imposed rather than the first year. In the first year, the elasticity of demand is fairly low, as people who own oil heaters are not likely to get rid of them right away. But over time they may switch to other energy sources and people buying new heaters for their homes will more likely choose gas or electric, so the tax will have a greater impact on quantity.

b. The tax revenue is likely to be higher in the first year after it is imposed than in the fifth year. In the first year, demand is more inelastic, so the quantity does not decline as much and tax revenue is relatively high. As time passes and more people substitute away from oil, the equilibrium quantity declines, as does tax revenue.