Chapter 7 problems.

To answer the questions that follow, refer to the diagram below describing the market for cigarettes.

1. At the equilibrium price and quantity for the cigarette market, what is
   a. consumers surplus.
   b. producers surplus.

2. If a price ceiling was imposed at $.80 per pack (and there is no black market)
   a. how many packs of cigarettes would be sold?
   b. what is consumers’ surplus? are consumers better or worse off than before the price ceiling?
   c. what is producers’ surplus? are producers better or worse off than before the price ceiling?
   d. what is the “deadweight loss” associated with the price ceiling?
   e. why would there be an incentive to form a “black market” in cigarettes?

3. Suppose a quota was imposed at 100m. packs per day.
   a. what would cigarettes sell for?
   b. what would consumers’ surplus be? are they better or worse off than without the quota?
   c. what would producers’ surplus be ? are they better or worse off than without the quota?
   d. what is the deadweight loss associated with this quota?
   e. compared to the result in (2), the same number of cigarettes are sold. How do the consequences of the quota and price ceiling differ?
4. Suppose that a $.40 tax was imposed on each pack of cigarettes and this caused the supply curve for cigarettes to shift to the dashed supply curve in the diagram below.

a. how much tax revenue is generated by the $.40 tax?
b. how much worse off are consumers as a result of the tax (i.e. how much did consumers’s surplus drop)?
c. how much worse off are producers as a result of the tax (i.e. how much did producers’ surplus drop)?
d. what is the “deadweight” loss associated with this tax?

5. Given the above cigarette tax, if the demand curve were more inelastic,
   a. would the tax revenue generated be greater or lesser?
   b. would the share of the tax passed on to the consumer be greater or lesser?
   c. would the loss to producers be greater or lesser?

6. Given the above cigarette tax, if the supply curve were more inelastic
   a. would the tax revenue generated be greater or lesser?
   b. would the share of the tax passed on to the consumer be greater or lesser?
Answers.

1a. 80m.
b. 80m.

2a. 100m
b. Consumers’ surplus is 100m so consumers are $20m better off than without a ceiling.
c. Producers’ surplus is 20m so producers are $60m worse off than without a ceiling.
d. The deadweight loss is $40m. That is, society is net, $40m better off without the ceiling than with it.
e. There is an incentive to form a black market because, at the price of $.80, there are many people wanting to buy cigarettes that are unable to get them (i.e. there is a shortage). People who are able to buy the cigarettes for $.80 could find people willing to pay more than $.80 for them.

3a. Cigarettes would sell for $1.60.
b. Consumers’ surplus would be $20m so they are $60m worse off than without the quota.
c. Producers’ surplus would be $100m so they are $20m better off than without the quota.
d. The deadweight loss is $40m.
e. As compared to the quota, the price ceiling generates greater losses for producers and smaller losses (actually a gain in the example given) for consumers.

4a. $60m.
b. Consumers’ surplus is reduced from $80m to 45m, so consumers are $35m worse off.
c. Producers’ surplus is reduced from $80m to 45m, so producers are $35m worse off.
d. The deadweight loss is $10m. This equals the loss to consumers and producers ($70m total) minus the tax revenue generated ($60m).

5a. If demand was more inelastic, more tax revenue would be generated since cigarette sales would fall less.
b. The share of the tax passed onto the consumer would be greater (i.e. the price would increase more).
c. The loss to producers would be smaller since more of the tax increase would be passed on in the form of a price increase.

6a. If the supply curve were more inelastic, more tax revenue would be generated since cigarette sales would fall less.
b. The share of the tax passed onto consumers would be lesser since the equilibrium price would rise less.