**Chapter 5 Elasticity Calculation:**

1. **3rd Edition:** p. 111, Problems and Applications, Q3
   
2. **4th Edition:** p. 110, Problems and Applications, Q4

   a. If your income is $10,000, your price elasticity of demand as the price of compact discs rises from $8 to $10 \[(\frac{Q_i - Q_f}{Q_i}) / (\frac{I_i - I_f}{I_i})\] (or change in quantity due to price) sometimes the formula will give a negative number but remember its an absolute value, so it is always positive, thus the calculation \[\frac{(40 - 32)/40}{(8 - 10)/8}\] = -0.80 but remember it’s a positive number thus = 0.80. If your income is $12,000, the elasticity is \[\frac{(50 - 45)/50}{(8 - 10)/8}\] = 0.4.

   Also, you are not required to use my percentage change method and can use the midpoint method in the book. To be honest, using the percentage change instead of the midpoint method requires no memorizing equations, at least for me. However, if you choose to use the midpoint method, here’s the solution.

   \[
   (Q2-Q1)/(Q2+Q1)/2 \div (I2-I1)/(I1+I2)/2 \\
   (32-40)/(32+40)/2 \div (10-8)/(10+8)/2 = -1 ,
   \]

   but remember no negative numbers, thus 1

   If using the midpoint method for the second part, -0.473, but once again no negative numbers, thus 0.473.

   b. If the price is $12, your income elasticity of demand as your income increases from $10,000 to $12,000 is \[\frac{(Q_i - Q_f)/Q_i}{(I_i - I_f)/I_i}\], \[\frac{(24 - 30)/24}{(10,000 - 12,000)/10,000}\] = -0.25/-0.20 = 1.25. If the price is $16, your income elasticity of demand as your income increases from $10,000 to $12,000 is \[\frac{(8 - 12)/8}{(10,000 - 12,000)/10,000}\] = -0.50/-0.20 = 2.5.

   You can use the midpoint method if you choose...

**Chapter 4**

2. **3rd Edition:** p. 87, Problems and Applications, Q8

   **4th Edition:** Not in the text, so here’s the question.

   The case study presented in the chapter (3rd Edition) discussed cigarette taxes as a way to reduce smoking. Now think about the markets for other tobacco products such as cigars and chewing tobacco.

   a. Are these goods substitutes or complements for cigarettes?

   b. Using a supply-and-demand diagram, show what happens in the markets for cigars and chewing tobacco if the tax on cigarettes is increased.

   c. If policymakers wanted to reduce total tobacco consumption, what policies could they combine with the cigarette tax?

   a. Cigars and chewing tobacco are substitutes for cigarettes, since a higher price for cigarettes would increase the demand for cigars and chewing tobacco.

   b. An increase in the tax on cigarettes leads to increased demand for cigars and chewing tobacco. The result, as shown in Figure for cigars, is a rise in both the equilibrium price and quantity of cigars and chewing tobacco.
The results in part (b) showed that a tax on cigarettes leads people to substitute cigars and chewing tobacco for cigarettes when the tax on cigarettes rises. To reduce total tobacco usage, policymakers might also want to increase the tax on cigars and chewing tobacco, or pursue some type of public education program.

Chapter 4
4th Edition: p. 86, Problems and Applications, Q7
a. When a hurricane in South Carolina damages the cotton crop, it raises input prices for producing sweatshirts. As a result, the supply of sweatshirts shifts to the left, as shown in Figure 19. The new equilibrium has a higher price and lower quantity of sweatshirts.
b. A decline in the price of leather jackets leads more people to buy leather jackets, reducing the demand for sweatshirts. The result, shown in Figure 20, is a decline in both the equilibrium price and quantity of sweatshirts.

![Figure 20](image)

Figure 20

c. The effects of colleges requiring students to engage in morning calisthenics in appropriate attire raises the demand for sweatshirts, as shown in Figure 21. The result is an increase in both the equilibrium price and quantity of sweatshirts.

![Figure 21](image)

Figure 21

d. The invention of new knitting machines increases the supply of sweatshirts. As Figure
As Figure 22 shows, the result is a reduction in the equilibrium price and an increase in the equilibrium quantity of sweatshirts.

![Figure 22](image)

Chapter 5:

4. 3rd Edition: p. 112, Problems and Applications, Question 10
4th Edition: p. 111, same P&A and question # as above

a. As Figure 2 shows, in both markets, the increase in supply reduces the equilibrium price and increases the equilibrium quantity.

b. In the market for pharmaceutical drugs, with inelastic demand, the increase in supply leads to a relatively large decline in the price and not much of an increase in quantity.
c. In the market for computers, with elastic demand, the increase in supply leads to a relatively large increase in quantity and not much of a decline in price.

d. In the market for pharmaceutical drugs, since demand is inelastic, the percentage increase in quantity will be less than the percentage decrease in price, so total consumer spending will decline. In contrast, since demand is elastic in the market for computers, the percentage increase in quantity will be greater than the percentage decrease in price, so total consumer spending will increase.

Chapter 6:
5. 3rd Edition: p. 132, Problems and Applications, Q3. Be sure to graph each part of the question.
4th Edition: p. 133, Problems and Applications, Q3
a. The equilibrium price of Frisbees is $8 and the equilibrium quantity is 6 million Frisbees.

b. With a price floor of $10, the new market price is $10 since the price floor is binding. At that price, only 2 million Frisbees are sold, since that’s the quantity demanded.

b. If there’s a price ceiling of $9, it has no effect, since the market equilibrium price is $8, below the ceiling. So the equilibrium price is $8 and the equilibrium quantity is 6 million Frisbees.


The burden of a tax is divided between buyers and sellers depending on the elasticity of demand and supply. Elasticity represents the willingness of buyers or sellers to leave the market, which in turns depends on their alternatives. When a good is taxed, the side of the market with fewer good alternatives cannot easily leave the market and thus bears more of the burden of the tax.

a. Figure 9 shows the effect of a tax on gun buyers. The tax reduces the demand for guns from $D_1$ to $D_2$. The result is a rise in the price buyers pay for guns from $P_1$ to $P_2$, and a decline in the quantity of guns from $Q_1$ to $Q_2$.

![Figure 9](image1)

b. Figure 10 shows the effect of a tax on gun sellers. The tax reduces the supply of guns from $S_1$ to $S_2$. The result is a rise in the price buyers pay for guns from $P_1$ to $P_2$, and a decline in the quantity of guns from $Q_1$ to $Q_2$.

![Figure 10](image2)
c. Figure 11 shows the effect of a binding price floor on guns. The increase in price from $P_1$ to $P_f$ leads to a decline in the quantity of guns from $Q_1$ to $Q_2$. There is excess supply in the market for guns, since the quantity supplied ($Q_3$) exceeds the quantity demanded ($Q_2$) at the price $P_f$.

Figure 11

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d. Figure 12 shows the effect of a tax on ammunition. The tax on ammunition reduces the demand for guns from $D_1$ to $D_2$, because ammunition and guns are complements. The result is a decline in the price of guns from $P_1$ to $P_2$, and a decline in the quantity of guns from $Q_1$ to $Q_2$.

Figure 12