Assignment 1

ECON3122, Intermediate Microeconomics

Due: Thursday, January 31st, by end of class

Directions: Answer all questions completely. Note the due date of the assignment. Late assignments will be accepted at the cost of 15 points per day, up until 3pm on Tuesday, February 4th. At that time I will return the graded assignments and post the answers on the web. You may turn in assignments to me after that time so that I can check your work for you, but please realize that you will not receive a grade for the assignment. You may work in a group consisting of up to 3 members – for each group please turn in only 1 set of answers and make sure all group member names are on that set of answers. All group members will receive the same grade.

1 Supply and Demand (42 points)

Consider the following supply and demand functions for Ramen noodles. The variables are defined in the table below. Constant values are given for the last 2 variables.

Variable	Meaning	Constant value
Q_D	Quantity demanded of Ramen	
Q_S	Quantity supplied of Ramen	
P_{Ramen}	Price of Ramen	
P_{Kraft}	Price of Kraft Mac and Cheese	$0.99
Y	Consumer income	$11,500

$$Q_D = 1,141,000 - (2,683,700) P_{Ramen} + (100,000) P_{Kraft} - (20) Y$$
$$Q_S = -100,021 + (680,000) P_{Ramen} \tag{1}$$

1. (7 points) Write down the inverse demand function for Ramen noodles.

2. (7 points) Find the equilibrium price and quantity in this market.

3. (7 points) Suppose that P_{Kraft} increases to $1.33. Recalculate the equilibrium price and quantity given this change.

4. (7 points) Calculate the own-price elasticity of demand. Use the equilibrium price and quantity as your initial price and quantity. Is demand elastic or inelastic at the equilibrium price and quantity?

5. (7 points) Calculate the cross-price elasticity for a 1% increase in the price of Kraft Macaroni and Cheese. Are Ramen noodles and Kraft Macaroni and Cheese substitutes or complements? Explain how you know whether they are substitutes or complements.

6. (7 points) Calculate the income elasticity for Ramen noodles. Use the equilibrium price and the constant value for income. Are Ramen noodles a normal good or an inferior good? How do you know? If it is a normal good, is it a necessity or a luxury?

2 Taxes (58 points)

The government has two goals: reduce the amount of Krunchy's Cereal sold and generate revenue while doing so. Currently it is considering placing a $0.70 per-unit tax on the consumers of Krunchy's Cereal. The supply and demand conditions (before the tax) for Krunchy's Cereal are:

$$Q_D = 1800 - 500P_{Krunchy}$$
$$Q_S = -300 + 200P_{Krunchy} \tag{2}$$

1. (8 points) A consumer advocate states that the proposed per-unit tax placed on the consumer will harm consumers. He argues that if the sales tax is placed on the producers this will lessen the harmful effects of the tax on consumers. Using what you know about the partial equilibrium analysis of a tax, is he right? Explain your answer.

2. (8 points) Calculate the equilibrium price and quantity BEFORE the per-unit tax is imposed.

3. (8 points) Calculate the equilibrium price and quantity AFTER the per-unit tax is imposed.

4. (8 points) What percentage of the tax is actually paid by the consumers in the market?

5. (8 points) What is the deadweight loss generated by this tax?

6. (8 points) How much tax revenue is generated?

7. (10 points) Suppose the government decides to impose a tax of $0.84 on Krunchy's cereal. Will this larger tax reduce the amount of Krunchy's cereal more than or less than the $0.7 tax? Will this larger tax raise more revenue or less revenue than the $0.7 tax?

3 Bonus (10 points)

Find the per-unit tax amount that the government should place on Krunchy's Cereal in order to generate the most revenue. Explain the method you used to find this answer.