

ECON 310

Practice exam Nazarov

**Questions 1-11**

Arnold consumes two goods: beef( $X$ ) and chicken( $Y$ ). His utility function is  $U = X^{0.5}Y^{0.5}$ . So  $MU_X = \frac{0.5Y^{0.5}}{X^{0.5}}$  and  $MU_Y = \frac{0.5X^{0.5}}{Y^{0.5}}$ . The prices of beef and chicken are 2 and 2, respectively. Arnold has fixed income in the form of endowment from his parents, which is \$1000 per month.

1. Find the optimal consumption level (quantity) of beef (5 points).
2. Find the optimal consumption level of chicken (5 points).

Assume that due to some random factors, the price for beef decreases to \$1 per unit.

3. Find the new optimum consumption level of beef (5 points).
4. Find the new optimum consumption level of chicken (5 points).

5. Graphically show the initial optimal consumption level of beef and chicken (Questions 1-2) and the new consumption level of beef and chicken (Questions 3-4). On the same graph show substitution and income effects for beef resulting from the price decrease. For Arnold, is beef a normal or inferior good? Make sure to explain and label your graph. (15 points)

Assume that economy consists of 10 identical individuals as Arnold.

6. Find the aggregate demand for beef when the price level of beef is 2.  
(Hint: use the result received in question 1.)(5 points)
7. Find the aggregate demand for beef when the price level of beef is 1.  
(Hint: use the result received in question 3.)(5 points)

Assume that the aggregate demand curve has a linear form and given as  $Q = a - bP$  (Hint: for 8-9 use information from 6-7)

8. Find the value of the intercept  $a$  of the demand curve.(7.5 points)
9. Find the value of the slope  $b$  of the demand curve.(7.5 points)

10. Find the point elasticity of demand at the price level 2.(5 points)
11. Find the consumer surplus at the price level 2.(10 points)



***Bonus question (10 points)***

Assume that the insurance company does not know your individual likelihood of the loss and bases the premium that they charge on some population average. The premium that they charge is \$19. Which is the minimum probability of the loss happening to you that will make you purchase this insurance? (Show your work)