

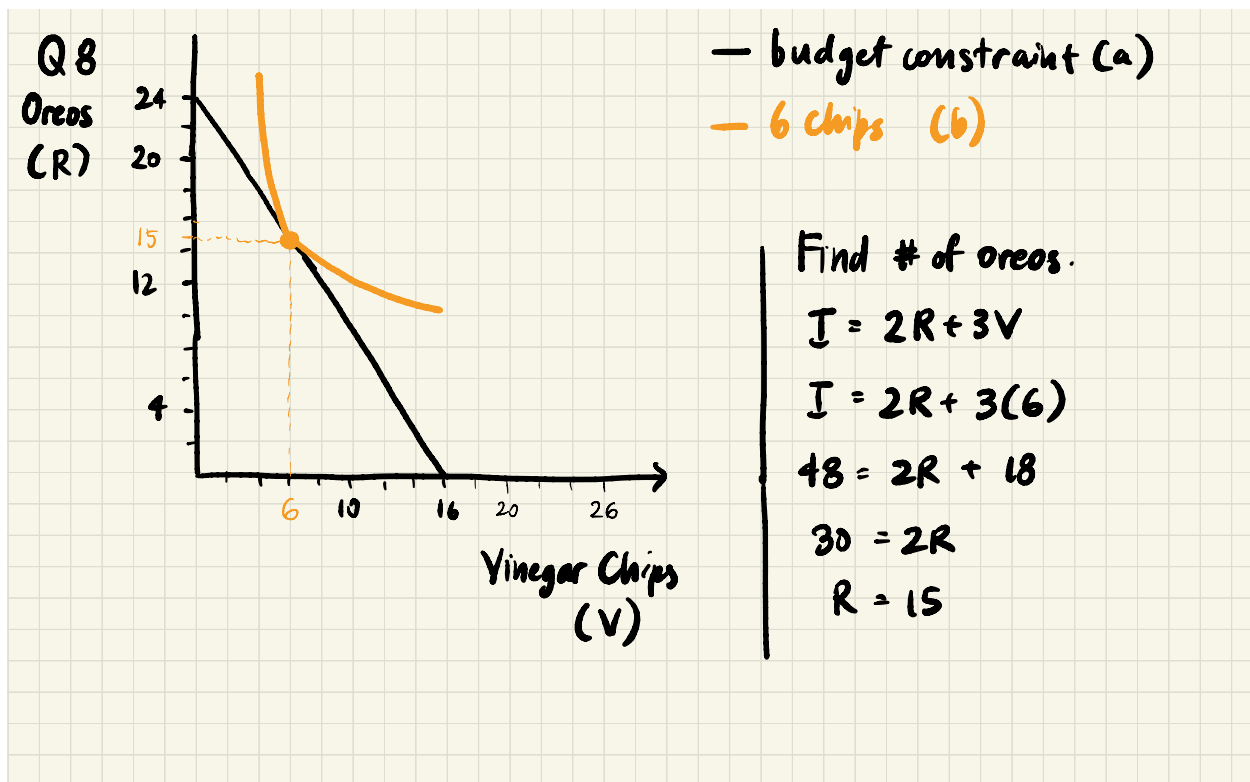
Problem Set 5
Due before Lecture 6

On what and how to submit

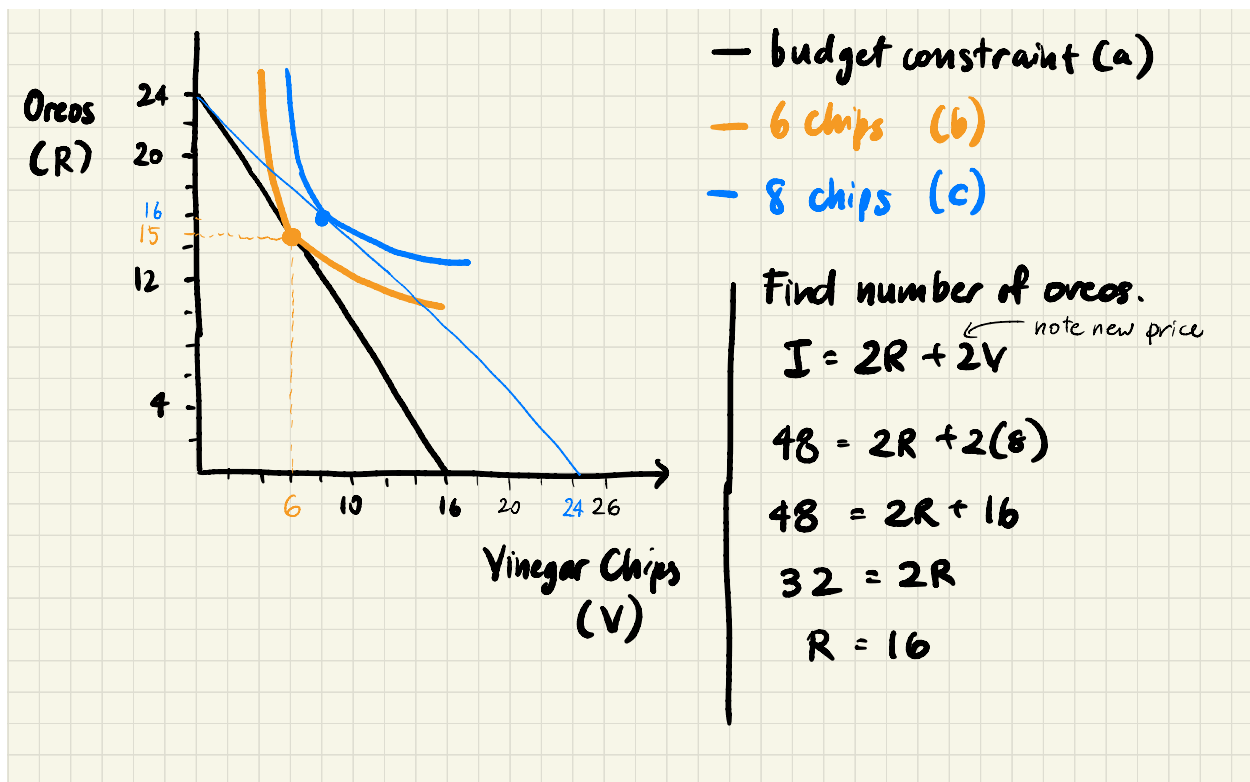
- For this and all future problem sets, questions are from the “Problems” section of the questions at the end of the chapter.
- Due before Lecture 6 to Blackboard. See assignment turn-in on course home page.
- Submit a pdf file
- Name the file “ps05-[lastname].pdf”. For example, my file would be “ps05_brooks.pdf”.
- In addition, write your name at the top of the problem set.
- You do not need to type your submission. Any **legible** submission is ok. For example, you can write the problem set with hand-drawn graphs, take a picture, and submit the picture as a pdf.

1. GLS Chapter 5, Question 8

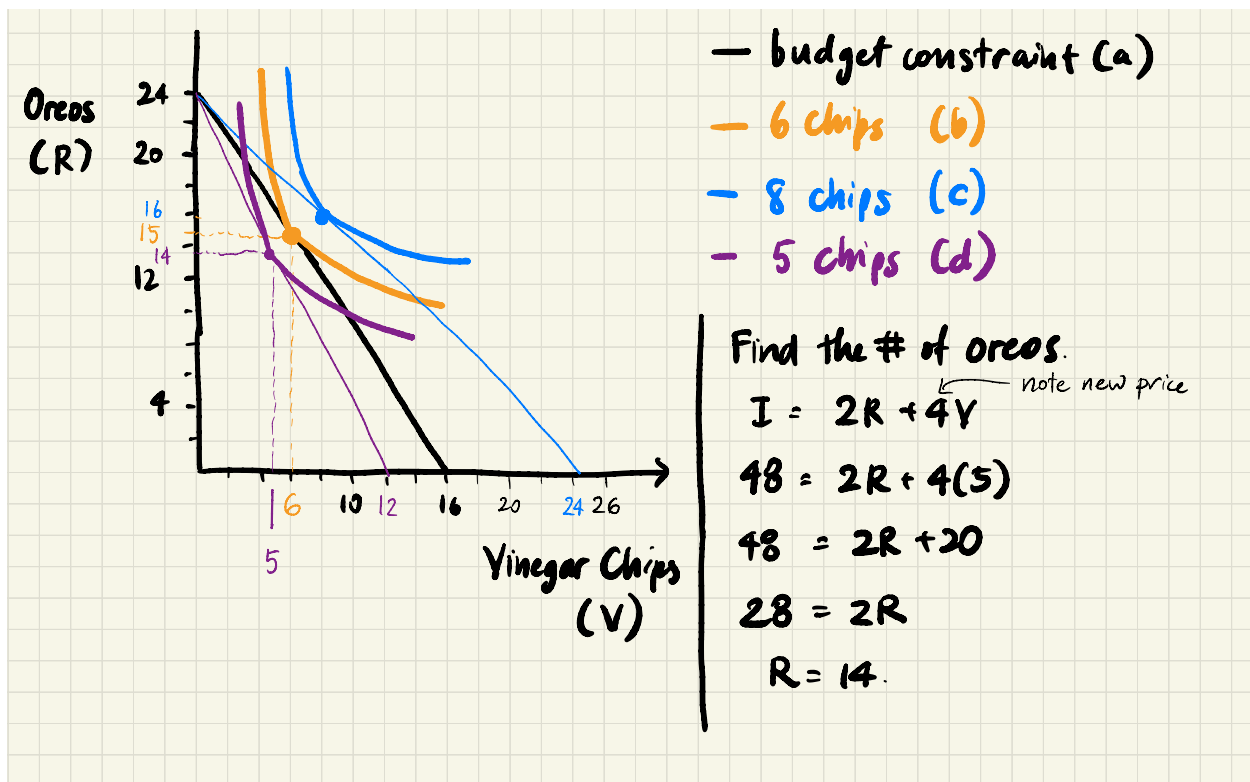
(a) and (b)



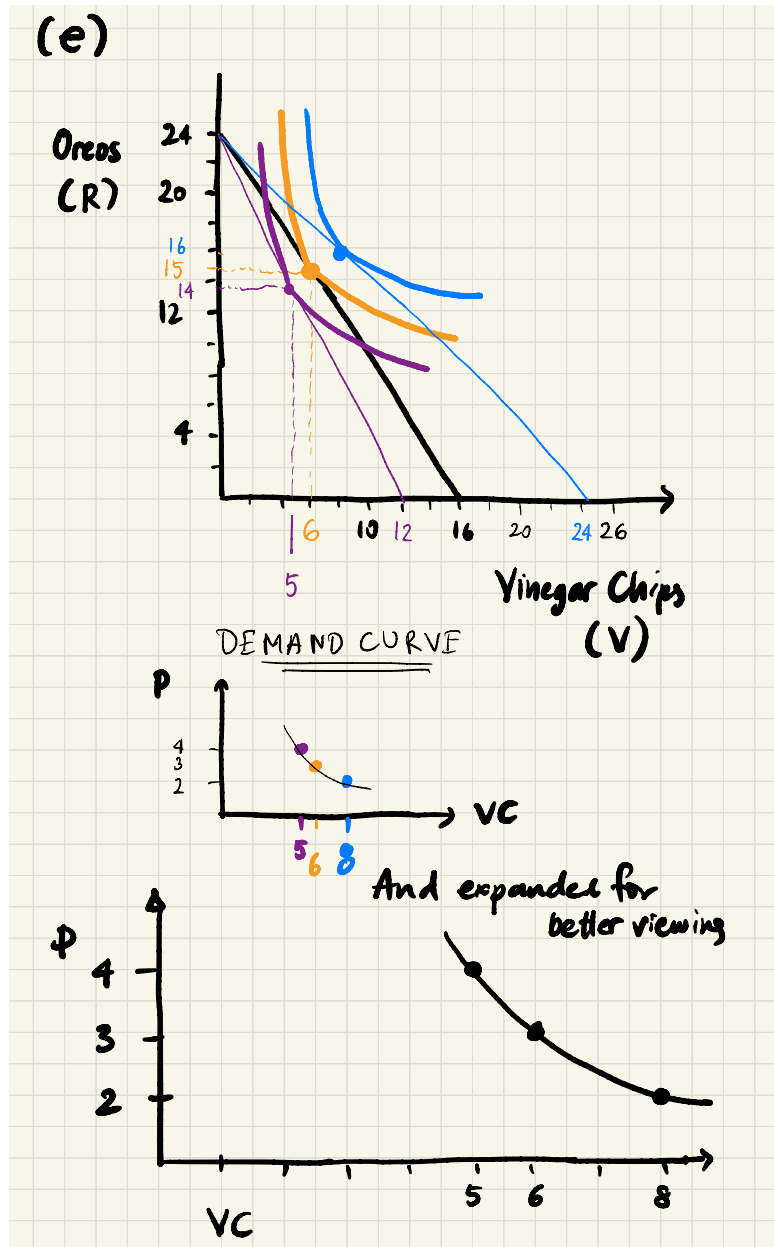
(c)



(d)



(e)



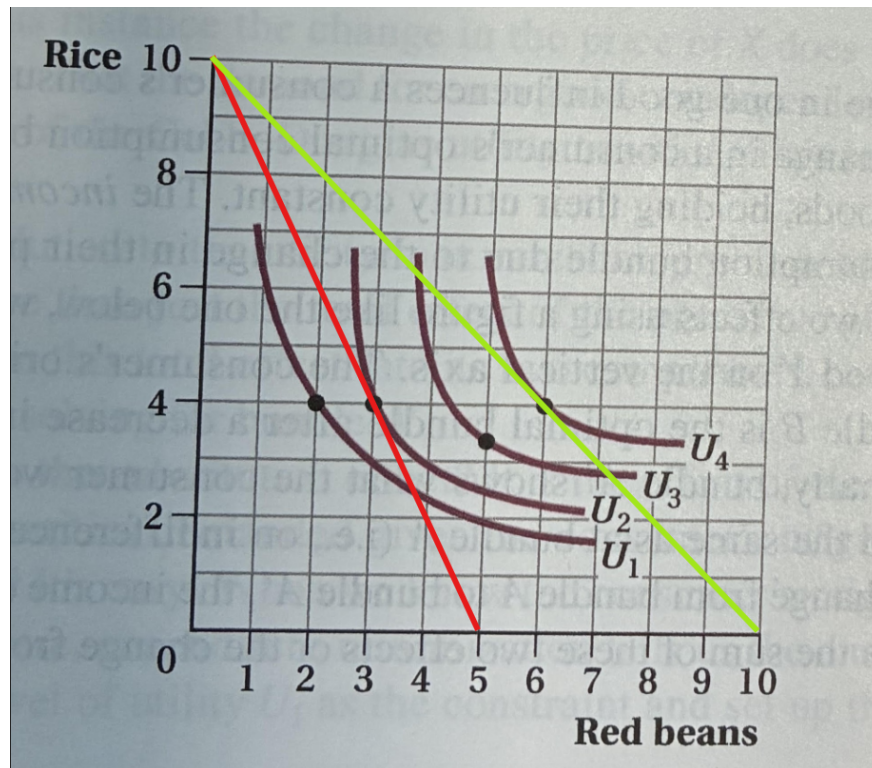
2. GLS Chapter 5, Question 16

(a) For this question, remember that you can draw a linear demand curve when you know two combinations of P and Q . Start the problem by drawing the budget constraint that the prices imply.

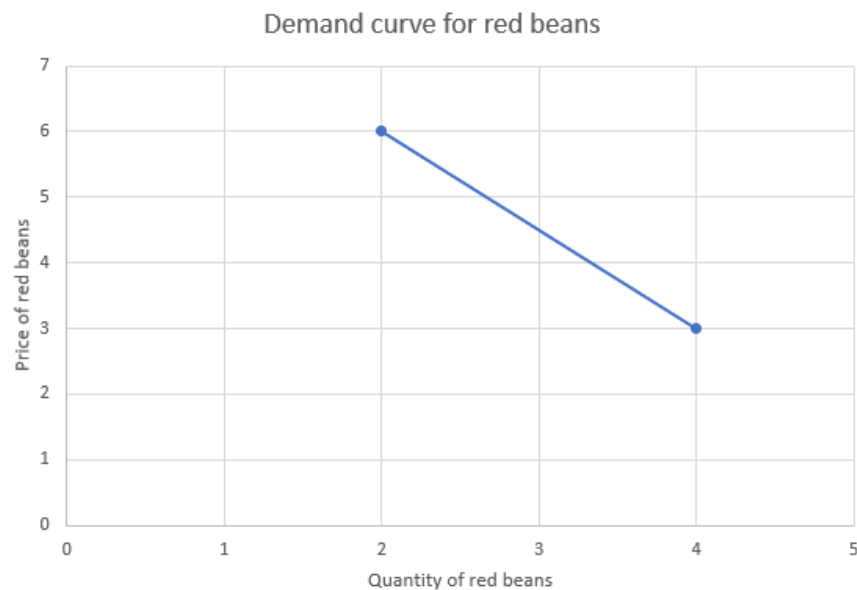
First, find the quantity of red beans that Gaston prefers at each price. In both cases, when Gaston spends all his money on rice, he can purchase 10 servings. This means that $(0, 10)$ is one point on the budget constraint.

The red budget constraint shows Gaston's preferred quantity of red beans when the price of

red beans is \$4. If Gaston spends all his money on red beans he can buy 5 servings of red beans, and he prefers three servings. The green budget constraint shows Gaston's preferred quantity of red beans when the price of red beans is \$2. If Gaston spends all his money on red beans he can buy 10 servings of red beans, and he prefers six servings.

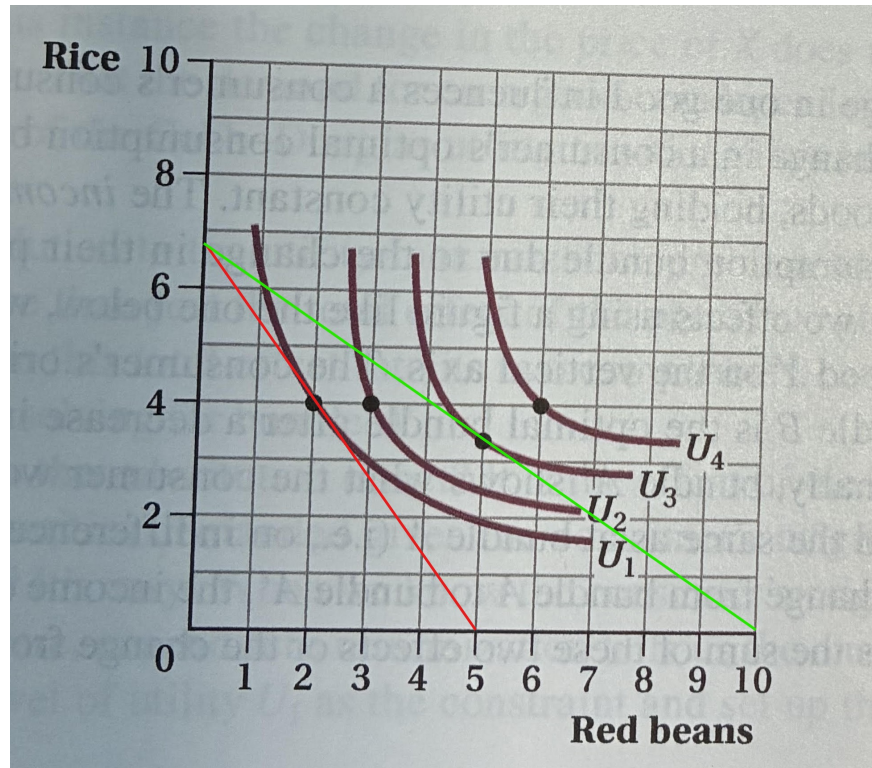


I then take these two points – (3, 4) and (6, 4) – and graph them into a demand curve. See below:

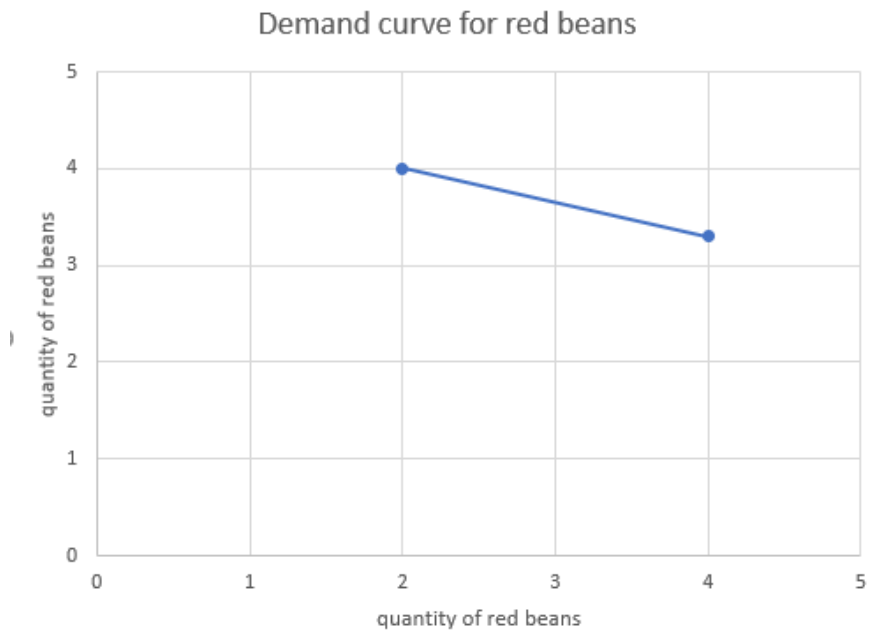


(b) This follows the same logic as (a), except that the budget constraint no longer has a point at (0, 10), since the price of rice is no longer \$2. When the price of rice is \$3 and Gaston spends all his money on rice, he can purchase $20/3 = 6\frac{2}{3}$ servings of rice.

See the budget constraint lines below, same colors as (a).



This yields the following demand curve:



(c) When the price of rice increases, Gaston's demand for red beans declines.

(d) Because an increase in price of rice leads to a decline of consumption of red beans, Gaston feels that red beans and rice are complements.

3. GLS Chapter 5, Question 22 (Question 18, second edition)

(a) For me, the easiest way to get the algebra right is to first draw the three individual demand curves. By doing this, you'll see that no-one is willing to pay more than \$6, and that the total market demand when $P = 0$ is 15. You can use both of these as useful checks on your work.

Again, by referring to your picture, you can see that for prices greater than 5, only Cooper is in the market. For prices between 3 and 5, both Carlene and Andre are in the market. For prices of 4 and below, all three people are in the market.

$$Q_T = \begin{cases} Q_C, & 5 \leq P < 8 \\ Q_C + Q_A, & 3 \leq P < 5 \\ Q_C + Q_A + Q_R, & 0 \leq P < 3 \end{cases}$$

which can be written as

$$Q_T = \begin{cases} 4 - (1/2)P, & 5 \leq P < 8 \\ 9 - 1.5P, & 3 \leq P < 5 \\ 15 - 3.5P & 0 \leq P < 3 \end{cases}$$

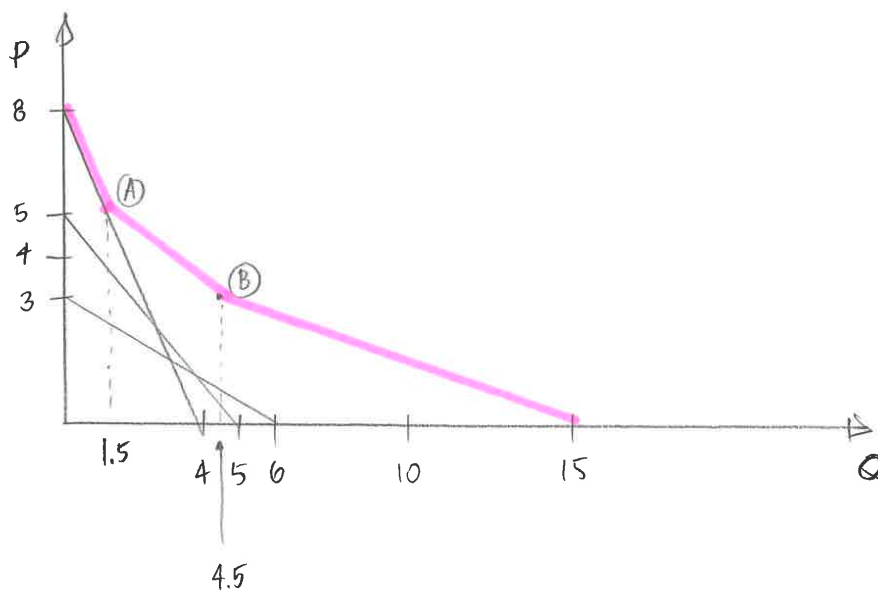
(b) See picture at end.

Chapter 15, Q18

$$Q_A = 5 - P, \quad P=0 \Rightarrow Q_A = 5, \quad Q_A=0 \Rightarrow P=5$$

$$Q_R = 6 - 2P, \quad P=0 \Rightarrow Q_R = 6, \quad Q_R=0 \Rightarrow 2P=6 \Rightarrow P=3$$

$$Q_C = 4 - \frac{1}{2}P, \quad P=0 \Rightarrow Q_C = 4, \quad Q_C=0 \Rightarrow \frac{1}{2}P=4 \Rightarrow P=8$$



Find point (A) by plugging in a price of 5 into market demand curve.

$$Q = 9 - 1.5(P) = 9 - (1.5)(5) = 1.5 \quad \text{OR} \quad Q = 4 - \frac{1}{2}P = 4 - \frac{1}{2}(5) = 1.5$$

Find point (B) by plugging in a price of 3 into market demand curve

$$Q = 15 - 3.5(P) = 15 - 3.5(3) = 15 - 10.5 = 4.5$$

OR

$$Q = 9 - (1.5)P = 9 - (1.5)3 = 9 - 4.5 = 4.5$$