

Problem Set 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 7.
- Name the file “ps06_[lastname].pdf”. For example, my file would be “ps06_brooks.pdf”.
- Turn in via this [google survey](#).
- Make sure your name is at the top of the submission.
- You do not need to type your submission. Any **legible** submission in pdf format is ok. For example, you can write the problem set with hand-drawn graphs, take a picture, make a pdf, and submit the pdf.

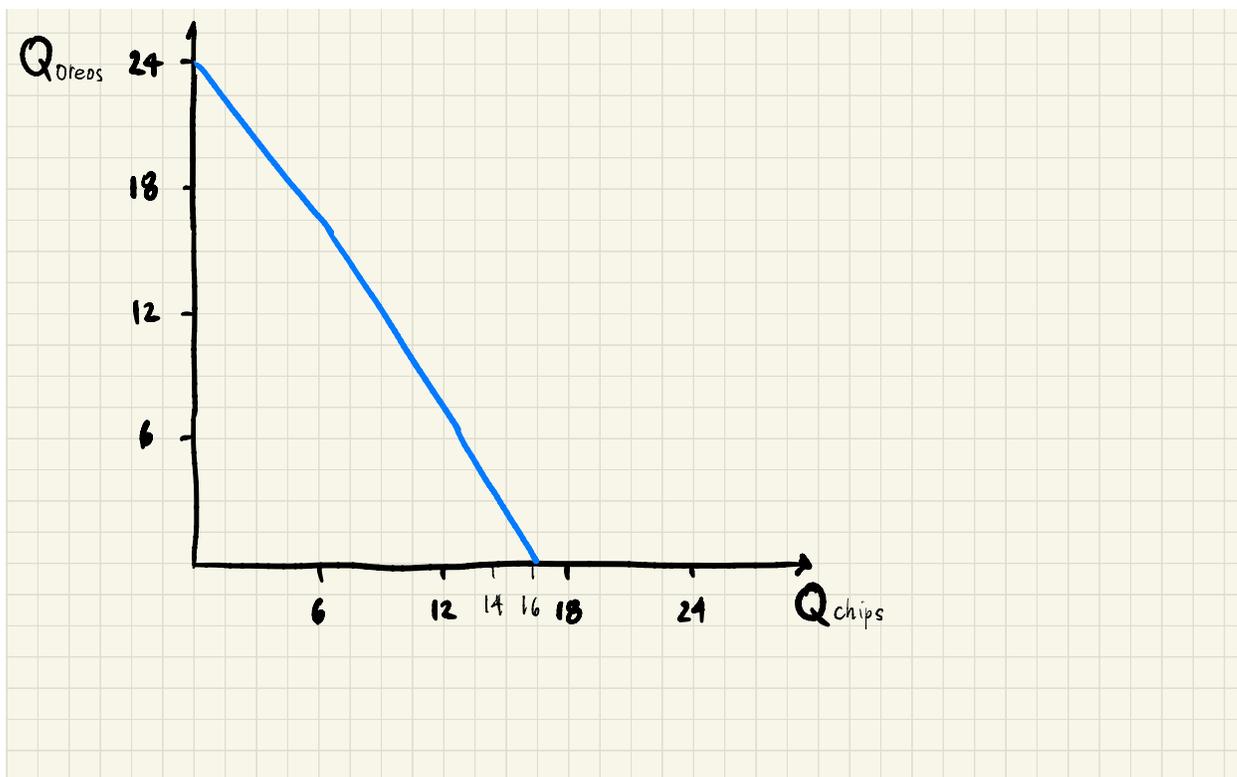
1. GLS Chapter 5, Question 8

(a) Draw budget constraint

Let Q_c be the quantity of chips, P_c be the price of chips, Q_o be the quantity of Oreos, and P_o be the price of Oreos.

See figure below. Note that you can write the budget constraint as

$$\begin{aligned} I &= P_c Q_c + P_o Q_o \\ 48 &= 3Q_c + 2Q_o \end{aligned}$$



(b) $Q_c = 6$: What is Q_o and where is the equilibrium A on the graph?

See figure in (d) for point A . To find Q_o :

$$\begin{aligned}
 I &= Q_c P_c + Q_o P_o \\
 48 &= 3(6) + 2Q_o \\
 2Q_o &= 48 - 18 \\
 2Q_o &= 30 \\
 Q_o &= 15
 \end{aligned}$$

(c) $Q_c = 8$ and $P_c = 2$: What is Q_o and where is the equilibrium B on the graph?

See figure in (d) for point B . To find Q_o :

$$\begin{aligned}
 I &= Q_c P_c + Q_o P_o \\
 48 &= 2(8) + 2Q_o \\
 2Q_o &= 48 - 16 \\
 2Q_o &= 32 \\
 Q_o &= 16
 \end{aligned}$$

(d) $Q_c = 5$ and $P_c = 4$: What is Q_o and where is the equilibrium C on the graph?

See figure below for point C . To find Q_o :

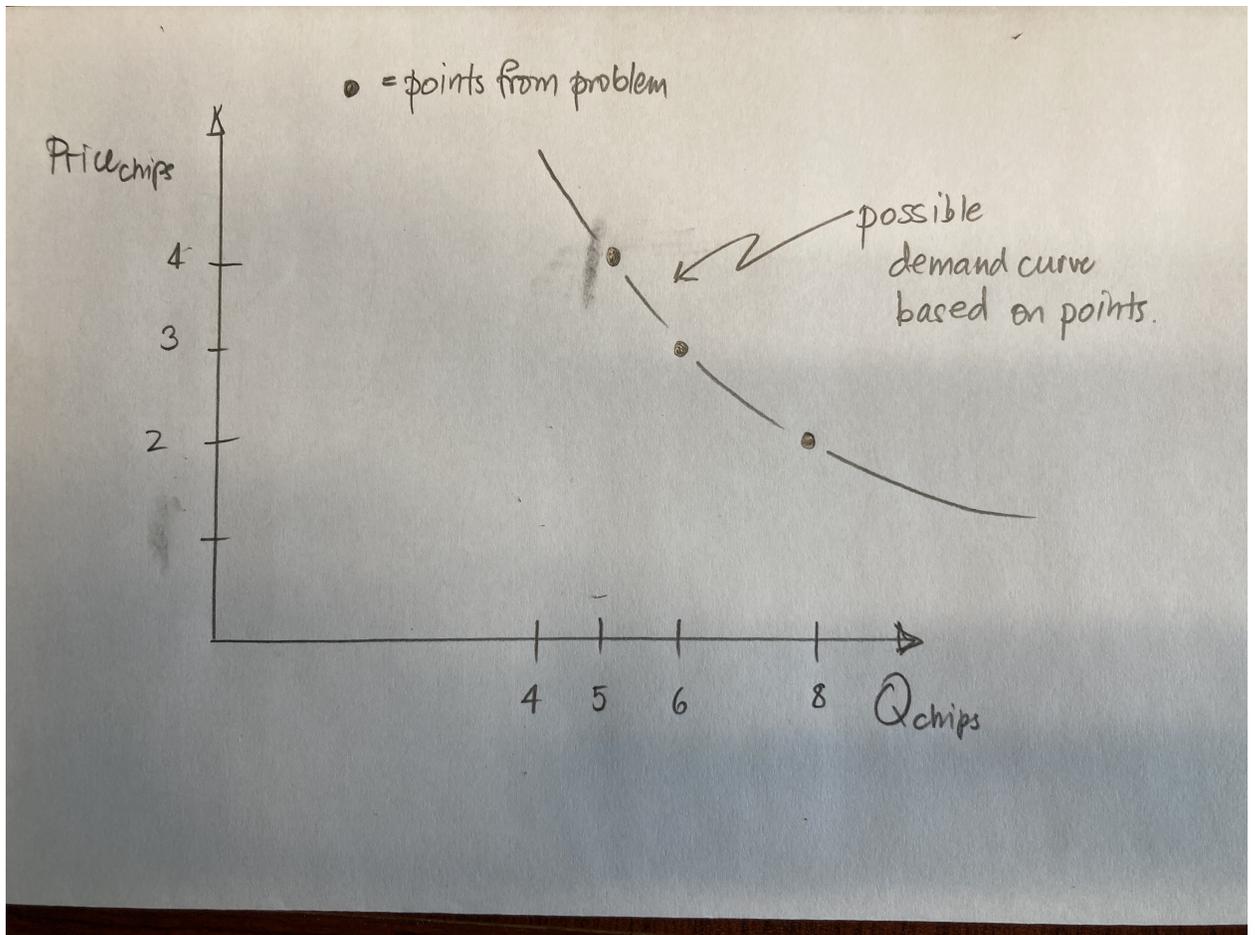
$$\begin{aligned}
 I &= Q_c P_c + Q_o P_o \\
 48 &= 4(5) + 2Q_o \\
 2Q_o &= 48 - 20 \\
 2Q_o &= 28 \\
 Q_o &= 14
 \end{aligned}$$



(e) Demand for chips

See figure below. To create this figure, note that we know three points along Juliette's

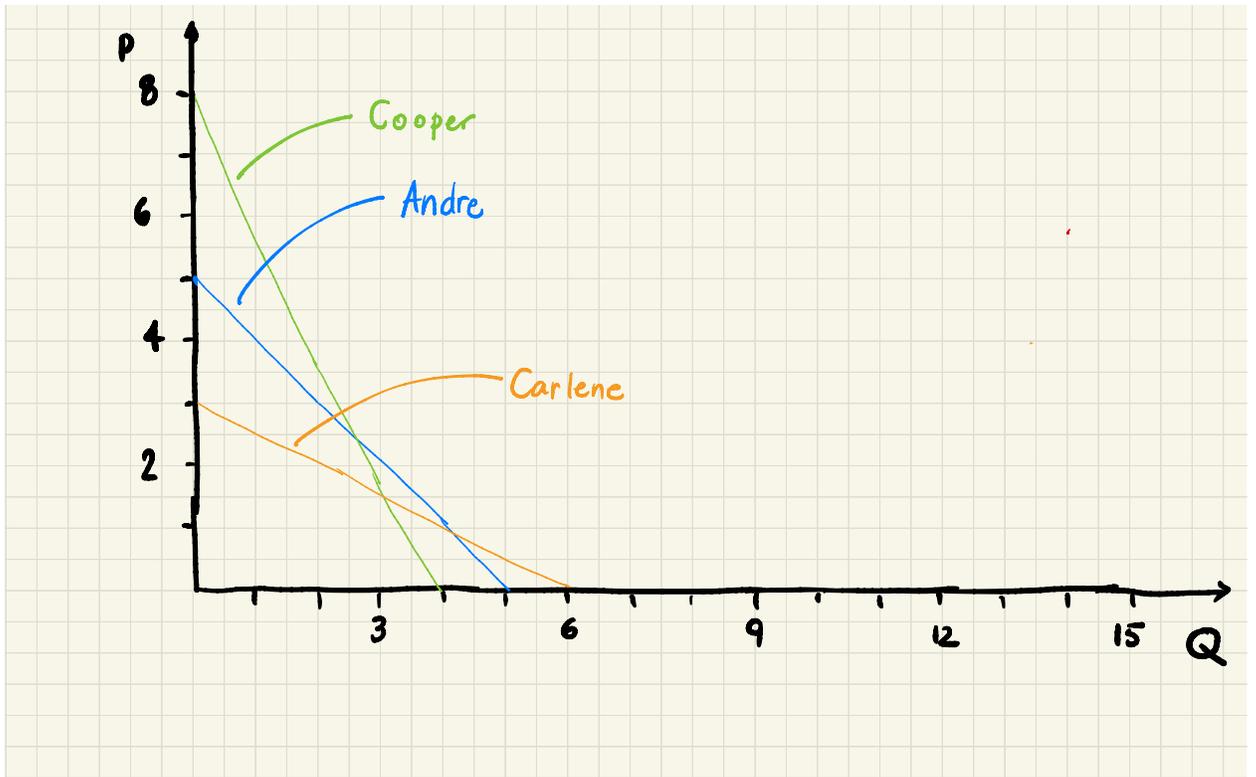
	Q_c	P_c
demand curve for chips:	5	4
	6	3
	8	2



2. GLS Chapter 5, Question 22

(a) Market demand curve for doughnuts

Draw the individual demand curves:



Find intercepts for each equation

	When $P = 0$, Q is	When $Q = 0$, P is
$A: Q_A = 5 - P$	5	5
$CA: Q_{CA} = 6 - 2P$	6	3
$CO: Q_{CO} = 4 - \frac{1}{2}P$	4	8

Prices 5 to 8

Note that for prices 5 to 8, the only participant in the market is CO , so the market demand, Q_{M1} is $Q_{M1} = Q_{CO} = 4 - \frac{1}{2}P$.

Prices 3 to 5

For prices 3 to 5, there are two participants in the market: CO and A . To find market demand, add CO 's quantity demanded and A 's quantity demanded:

$$\begin{aligned}
 Q_{M2} &= Q_{CO} + Q_A \\
 &= 4 - \frac{1}{2}P + 5 - P \\
 &= 9 - \frac{3}{2}P
 \end{aligned}$$

What is the Q intercept for where CO 's demand curve gets added to A 's? The kink is where $P = 5$, either on the new market demand curve, or CO 's demand curve. We'll

solve in CO 's curve since it's easier:

$$\begin{aligned}Q_{CO} &= 4 - \frac{1}{2}P \\ &= 4 - \frac{1}{2}5 \\ &= 1.5\end{aligned}$$

Prices 0 to 3

And then for prices 3 and below, all three people are in the market. The market demand curve is therefore

$$\begin{aligned}Q_{M3} &= Q_{CO} + Q_A + Q_{CA} \\ &= 4 - \frac{1}{2}P + 5 - P + 6 - 2P \\ &= 15 - 3.5P\end{aligned}$$

At what quantity does CA 's demand curve get added to the market? At a price of 3, what associated quantity in the market demand?

$$\begin{aligned}Q_{M3} &= 15 - 3.5P \\ &= 15 - 3.5(3) \\ &= 15 - 10.5 \\ &= 4.5\end{aligned}$$

Finally when the price is zero, what is total market demand? We can set $Q_{M3} = 0$, or we can add up the total willingness of pay at a price of zero from our first table: $5 + 6 + 4 = 15$. (You'll find the same answer by setting $P = 0$ in the Q_{M3} equation above.)

Now, how to write this in one equation?

$$Q_M = \begin{cases} 4 - \frac{1}{2}P, & P \geq 5 \\ 9 - \frac{3}{2}P, & 3 \leq P < 5 \\ 15 - 3.5P, & 0 \leq P < 3. \end{cases}$$

(b) Graph market demand

See figure.

