

## Problem Set 12

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 December 12 by 3:30 to your Box folder
- Name the file “ps12\_[lastname].[extension]”. For example, my file would be “ps12\_brooks.pdf”.
- 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.

### 1. Externalities

Suppose that consumers demand plastic junk with a demand curve of  $Q = 300 - 4P$ . Suppose also that producers make plastic junk with a market supply curve of  $Q = P - 15$ . As seems like, we will assume that plastic junk has an external cost of \$10/unit.

A graph is not not required for these problems, but will likely help you think through the steps and equilibria.

- (a) In a market without taxes or regulation, what is the equilibrium quantity and price of plastic junk?
- (b) Now suppose that the government recognizes the cost of plastic junk and charges producers a Pigouvian tax of \$10/unit. What is the new supply curve with this tax?
- (c) Find the new equilibrium price and quantity for plastic junk with the Pigouvian tax.
- (d) Name two external costs of plastic junk (on the production or consumption side), explaining why they are external costs.

### 2. Public goods

Suppose that Mr. A and Mr. B both like pasta. Mr. A’s demand for pasta is  $Q = 250 - \frac{1}{2}P$ , and that Mr. B’s demand for pasta is  $Q = 20 - \frac{1}{3}P$ .

(a) What is the total market demand for pasta? Write an equation and draw a graph. Beware: The market demand curve has a kink.

(b) Now suppose that instead of pasta, the demand curves are for national defense. Find the market demand curve for national defense. Write an equation and draw a graph.

### 3. Publicly provided goods

Give an example of a publicly provided private good, explaining why your example fits.