

Exercise session 5

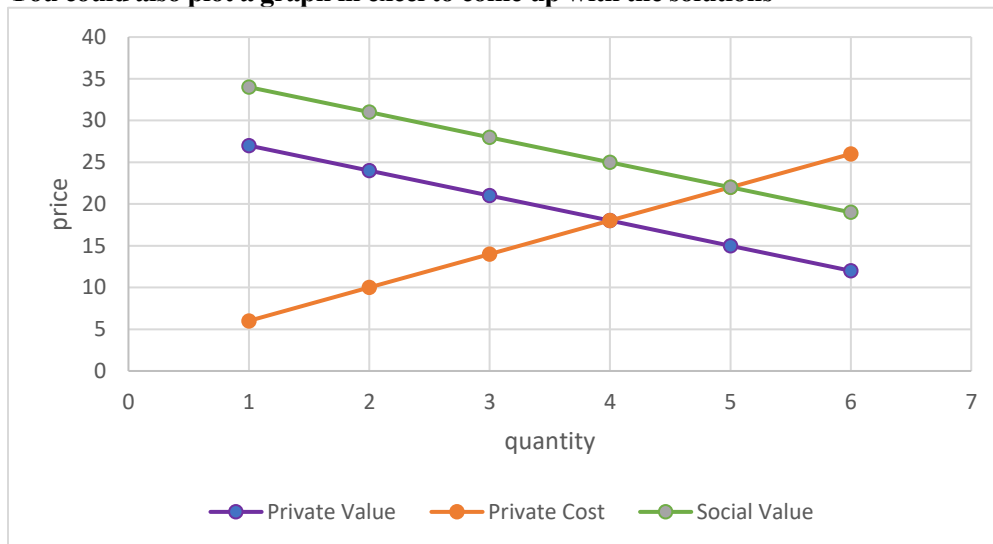
1. A paper plant produces water pollution during the production process. If the government forces the plant to internalize the negative externality, then the
 - a. supply curve for paper would shift to the right.
 - b. supply curve for paper would shift to the left.**
 - c. demand curve for paper would shift to the right.
 - d. demand curve for paper would shift to the left.

2. The following table shows the private value, private cost, and social value for a market with a positive externality.

<i>Quantity</i>	<i>Private Value</i>	<i>Private Cost</i>	<i>Social Value</i>
1	27	6	34
2	24	10	31
3	21	14	28
4	18	18	25
5	15	22	22
6	12	26	19

- a) What is the equilibrium quantity of output in this market? **Where Private value=private cost => 4 units**
- b) What is the socially-optimal level of output in this market? **Where Social value=private cost => 5 units**
- c) How large would a subsidy need to be in this market to move the market from the equilibrium level of output to the socially-optimal level of output? **The difference between private value and social values is 7 dollars at each level of output, meaning that external benefit is 7\$, therefore, subsidy of 7 dollars would internalize the positive externality.**

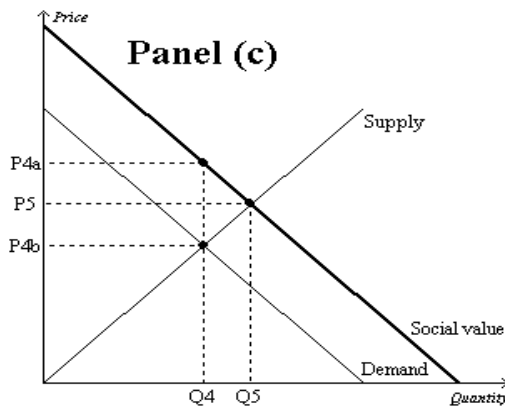
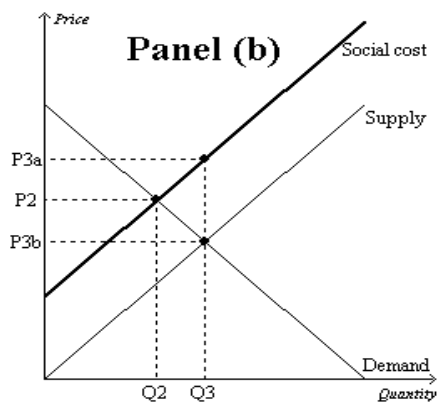
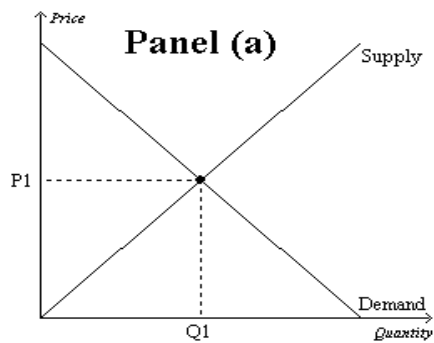
You could also plot a graph in excel to come up with the solutions



3. Which of the following is true of markets characterized by positive externalities?
 - a. Social value exceeds private value, and market quantity exceeds the socially optimal quantity.
 - b. Social value is less than private value, and market quantity exceeds the socially optimal quantity.
 - c. Social value exceeds private value, and market quantity is less than the socially optimal quantity.**
 - d. Social value seldom exceeds private value; therefore, social quantity is less than private quantity.

4. Which of the following activities, if any, represents an external cost?
 - a. The reduction in the incidence of chicken pox when children are inoculated against the disease.
 - b. The damage to a person's health from second hand smoke.**
 - c. The increase in local property values when the city creates a neighborhood park.
 - d. The price you pay for the prime rib that you consume at a local restaurant.

5) In the following figure



- a) Which graph represents a market with no externality? **Panel A**
- b) Which graph represents a market with a positive externality? **Panel C**
- c) Which graph represents a market with a negative externality? **Panel B**
- d) How much is the market equilibrium price and quantity in **Panel (b)**? **Q_3 and P_{3b}**
- e) The overuse of antibiotics leads to the development of antibiotic-resistant diseases.

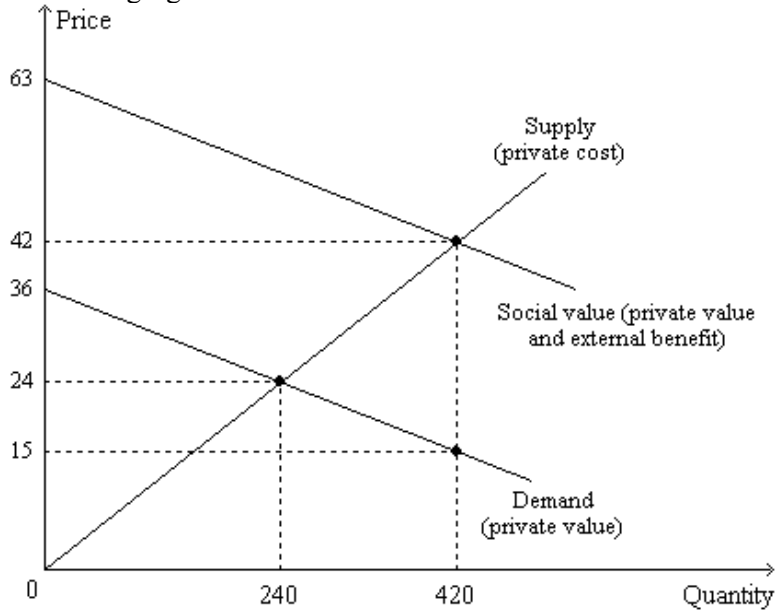
Therefore, the market for antibiotics is shown in... **Panel B**

f) The installation of a scrubber in a smokestack reduces the emission of harmful chemicals from the smokestack. Therefore, the market for smokestack scrubbers is shown in... **Panel C**

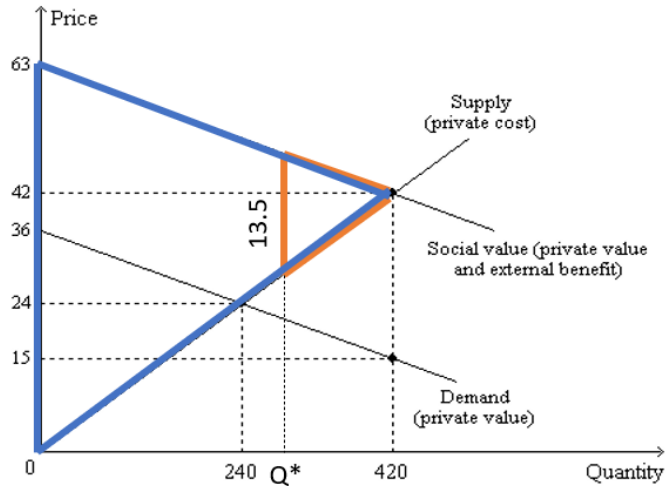
g) Which of the following is correct?

- a. A tax would move the market in Panel (b) and the market in Panel (c) closer to the socially optimal outcome.
- b. A subsidy would move the market in Panel (b) and the market in Panel (c) closer to the socially optimal outcome.
- c. **A tax would move the market in Panel (b) closer to the socially optimal outcome, but a subsidy would move the market in Panel (c) closer to the socially optimal outcome.**
- d. A subsidy would move the market in Panel (b) closer to the socially optimal outcome, but a tax would move the market in Panel (c) closer to the socially optimal outcome.

6. In the following figure:



- a) What type of market is represented? **Market with positive externality**
- b) Which of the following statements is correct?
 - a. The private value of the 420th unit of output is \$15.
 - b. The social value of the 420th unit of output is \$42.
 - c. The external benefit of the 420th unit of output is \$27.
 - d. **All of the above are correct.**
- c) "The social value of the last unit produced exceeds the private cost of the last unit produced by \$13.50." This statement is correct at which quantity of output?



Think of the blue and orange triangles as similar triangles. With the proportion method of triangles we have: $\frac{13.5}{63} = \frac{x}{420} \Rightarrow x = 90 \Rightarrow Q^* = 420 - 90 = 330$

- d) On the
- 390th unit of output, private value exceeds private cost.
 - 390th unit of output, private value exceeds external value.
 - 450th unit of output, private value exceeds social value.
 - 450th unit of output, private cost exceeds social value.**
- e) Taking into account private value *and* external benefits, how much is the maximum total surplus that can be achieved in this market? $420 \cdot 63 / 2 = 13230$