

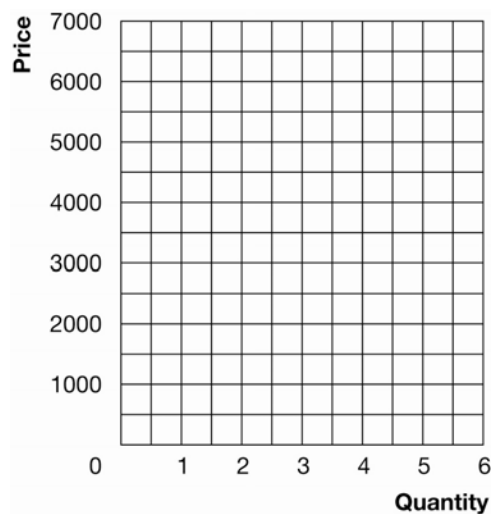
## Chapter 7

1. The following information describes the value Lauren Landlord places on having her five houses repainted. She values the repainting of each house at a different amount depending on how badly it needs repainting.

|  |       |
|--|-------|
| Value of new paint on first apartment house  | €5000 |
| Value of new paint on second apartment house | €4000 |
| Value of new paint on third apartment house  | €3000 |
| Value of new paint on fourth apartment house | €2000 |
| Value of new paint on fifth apartment house  | €1000 |

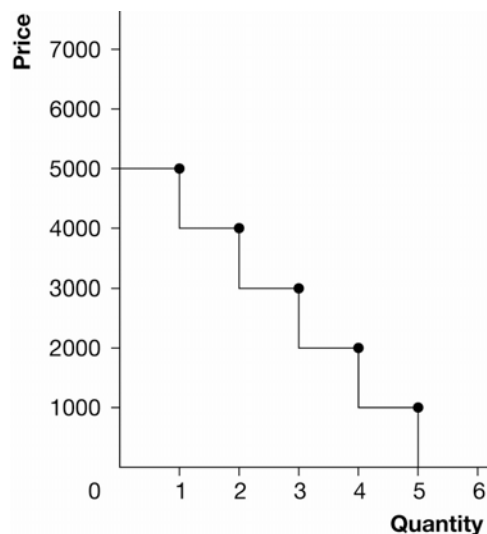
- a. Plot Lauren Landlord's willingness to pay in Exhibit 1.

Exhibit 1



Answer:  
See Exhibit 6.

Exhibit 6



- b. If the price to repaint her apartments is €5000 each, how many will she repaint? What is the value of her consumer surplus?

Answer:

One apartment painted.  $€5000 - €5000 = 0$ , therefore she has no consumer surplus.

- c. Suppose the price to repaint her apartments falls to €2000 each. How many apartments will Lauren choose to have repainted? What is the value of her consumer surplus?

Answer:

Four apartments painted.  $(€5000 - €2000) + (€4000 - €2000) + (€3000 - €2000) + (€2000 - €2000) = €6000$  of consumer surplus.

- d. What happened to Ms. Landlord's consumer surplus when the price of having her apartments repainted fell? Why?

Answer:

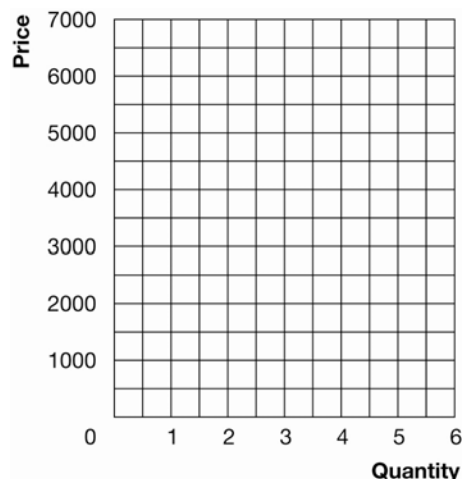
Her consumer surplus rose because she gains surplus on the unit she would have already purchased at the old price plus she gains surplus on the new units she now purchases due to the lower price.

2. The following information shows the costs incurred by Peter Painter when he paints apartments. Because painting is back breaking work, the more he paints, the higher the costs he incurs in both pain and chiropractic bills.

|   |       |
|---|-------|
| Cost of painting first apartment house  | €1000 |
| Cost of painting second apartment house | €2000 |
| Cost of painting third apartment house  | €3000 |
| Cost of painting fourth apartment house | €4000 |
| Cost of painting fifth apartment house  | €5000 |

- a. Plot Peter Painter's cost in Exhibit 2.

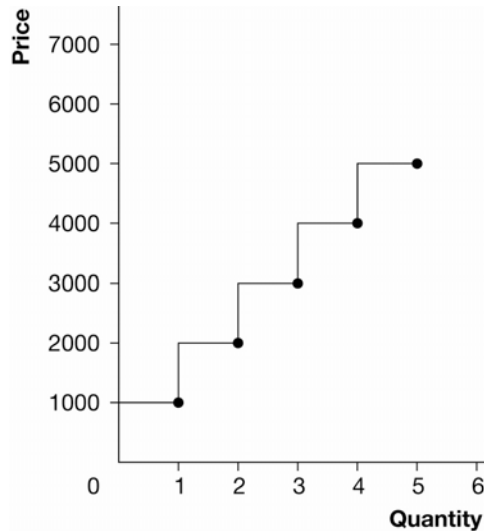
Exhibit 2



Answer:

See Exhibit 7.

## Exhibit 7



- b. If the price of painting apartment houses is €2000 each, how many will he paint? What is the value of his producer surplus?

Answer:

Two.  $(€2000 - €1000) + (€2000 - €2000) = €1000$  of producer surplus.

- c. Suppose the price to paint apartments rises to €4000 each. How many apartments will Peter choose to repaint? What is the value of his producer surplus?

Answer:

Four apartments.  $(€4000 - €1000) + (€4000 - €2000) + (€4000 - €3000) + (€4000 - €4000) = €6000$  of producer surplus.

- d. What happened to Mr. Painter's producer surplus when the price to paint apartments rose? Why?

Answer:

He received greater producer surplus on the units he would have produced anyway plus additional surplus on the units he now chooses to produce due to the increase in price.

3. Use the information about willingness to pay and cost from (1) and (2) above to answer the following questions.

- a. If a benevolent social planner sets the price for painting apartment houses at €5000, what is the value of consumer surplus? Producer surplus? Total surplus?

Answer:

Only one unit will be purchased so consumer surplus =  $(€5000 - €5000) = €0$ , producer surplus =  $(€5000 - €1000) = €4000$ , and total surplus =  $€0 + €4000 = €4000$ .

- b. If a benevolent social planner sets the price for painting apartment houses at €1000, what is the value of consumer surplus? Producer surplus? Total surplus?

Answer:

Only one unit will be produced so consumer surplus =  $(€5000 - €1000) = €4000$ , producer surplus =  $(€1000 - €1000) = €0$ , and total surplus =  $€4000 + €0 = €4000$ .

- c. If the price for painting apartment houses is allowed to move to its free market equilibrium price of €3000, what is the value of consumer surplus, producer surplus, and total surplus in the market? How does total surplus in the free market compare to the total surplus generated by the social planner?

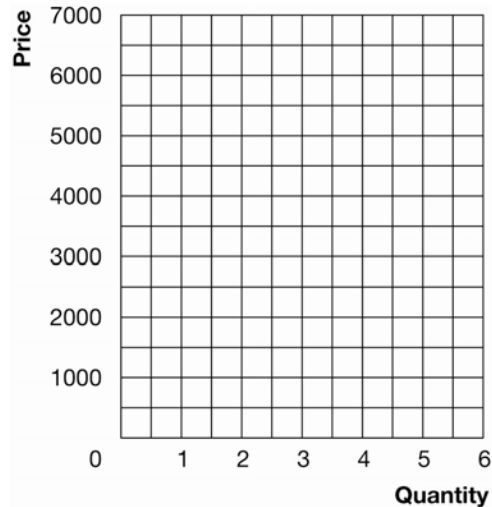
Answer:

Consumer surplus =  $(€5000 - €3000) + (€4000 - €3000) + (€3000 - €3000) = €3000$ .

Producer surplus =  $(€3000 - €1000) + (€3000 - €2000) + (€3000 - €3000) = €3000$ . Total surplus =  $€3000 + €3000 = €6000$ . Free market total surplus is greater than social planner total surplus.

4. In Exhibit 3, plot the linear supply and demand curves for painting apartments implied by the information in questions (1) and (2) above (draw them so that they contact the vertical axis). Show consumer and producer surplus for the free market equilibrium price and quantity. Is this allocation of resources efficient? Why?

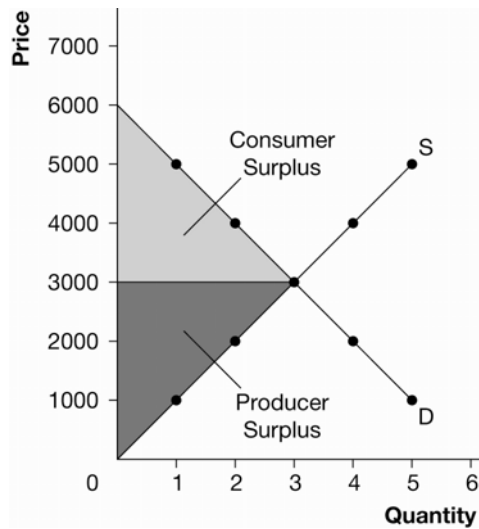
Exhibit 3



Answer:

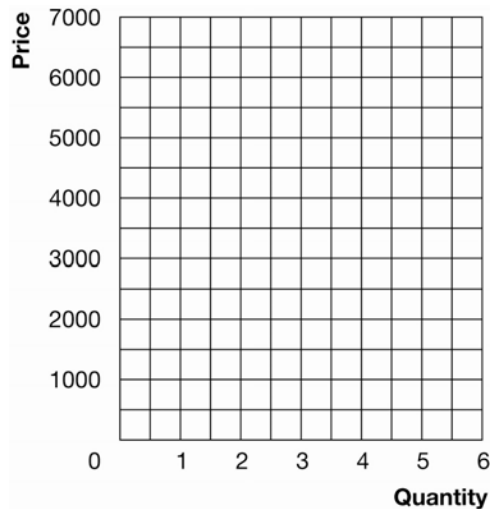
See Exhibit 8. Yes, it is efficient because at a quantity that is less than the equilibrium quantity we fail to produce units that buyers value more than their cost. At a quantity above the equilibrium quantity, we produce units that cost more than the buyers value them. At equilibrium we produce all possible units that are valued in excess of what they cost, which maximizes total surplus.

### Exhibit 8



5. Suppose Lauren Landlord has difficulty renting her dilapidated houses so she increases her willingness to pay for painting by €2000 per apartment. Plot Lauren's new willingness to pay along with Peter's cost in Exhibit 4. If the equilibrium price rises to €4000, what is the value of consumer surplus, producer surplus, and total surplus? Show consumer and producer surplus on the graph. Compare your answer to the answer you found in 3 (c) above.

### Exhibit 4



Answer:

See Exhibit 9.

Consumer surplus = €3000 + €2000 + €1000 + €0 = €6000.

Producer surplus = €3000 + €2000 + €1000 + €0 = €6000.

Total surplus = €6000 + €6000 = €12000.

Consumer surplus, producer surplus, and total surplus have all increased.

### Exhibit 9

