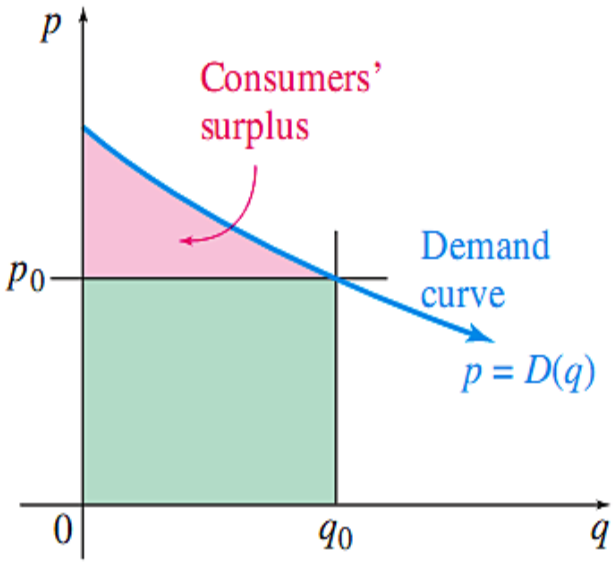
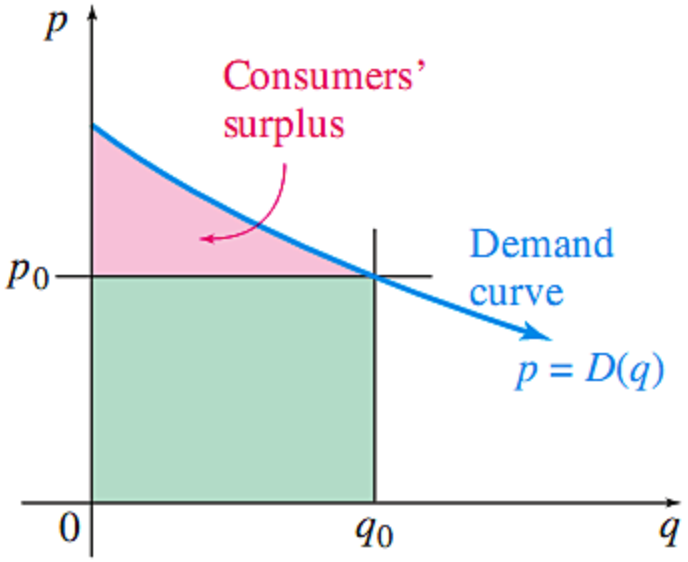
U4L5

Consumers' and Producers' Surplus

- At the equilibrium price for a product, consumers will want the same amount of the product that producers want to sell at that price.
- Some consumers would be willing to spend more for the item than the equilibrium price.
- The total of the differences between the equilibrium price of the item and the higher prices that individuals would be willing to pay is though of as savings realized by those individuals and is called the ***Consumers' surplus***.



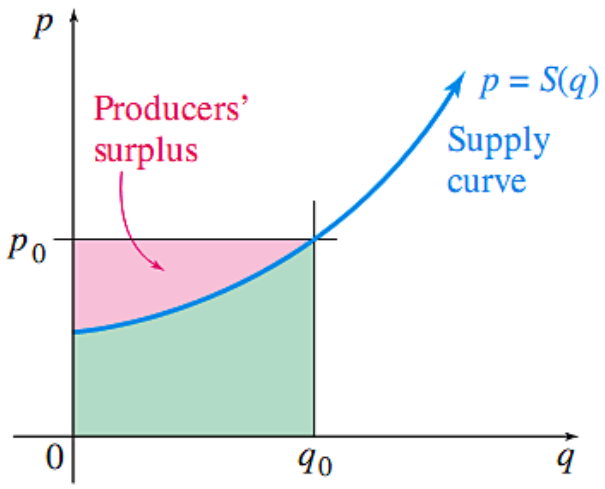


Consumers' Surplus

If $D(q)$ is a demand function with equilibrium price p_0 and equilibrium demand q_0, then

$$\textbf{Consumers' surplus} = \int_0^{q_0} [D(q) - p_0]\, dq.$$

- If some manufacturers would be willing to supply a product at a price that is lower than the equilibrium price, then the total of the differences between the equilibrium price and the lower prices at which manufacturers would sell the product is considered to be added income and is called the ***Producers' surplus***.



Producers' Surplus

If $S(q)$ is a supply function with equilibrium price p_0 and equilibrium supply q_0, then

$$\textbf{Producers' surplus} = \int_0^{q_0} [p_0 - S(q)]\, dq.$$

Suppose the price (in dollars per ton) for oat bran is $D(q) = 400 - e^{q/2}$ when the demand for the product is q tons. Also, suppose that the function $S(q) = e^{q/2} - 1$ gives the price (in dollars per ton) with the supply is q tons. Find the consumers' surplus and the producers' surplus.

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Consumers' surplus $= \int_0^{q_0} [D(q) - p_0]\, dq.$

Producers' surplus $= \int_0^{q_0} [p_0 - S(q)]\, dq.$

Suppose the weekly demand for a certain brand of blue ray players is given by $D(q) = 200 - 5q - q^2$ dollars per player, and the supply function is $S(q) = q^2 + 4q$ dollars per player, where q is in hundreds of blue ray players per week. Find the equilibrium quantity. Round to the nearest unit.

A. 8

B. 9

C. 10

D. 7

Suppose the weekly demand for a certain brand of blue ray players is given by $D(q) = 200 - 5q - q^2$ dollars per player, and the supply function is $S(q) = q^2 + 4q$ dollars per player, where q is in hundreds of blue ray players per week. Find the equilibrium price.

A. $\$80$

B. $\$92$

C. $\$87$

D. $\$96$

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A. $\$501.33$

B. $\$671.32$

C. $\$381.96$

D. $\$481.96$

Suppose the weekly demand for a certain brand of blue ray players is given by $D(q) = 200 - 5q - q^2$ dollars per player, and the supply function is $S(q) = q^2 + 4q$ dollars per player, where q is in hundreds of blue ray players per week. Find the producers' surplus.

A. $\$511.23$

B. $\$469.33$

C. $\$495.28$

D. $\$552.19$