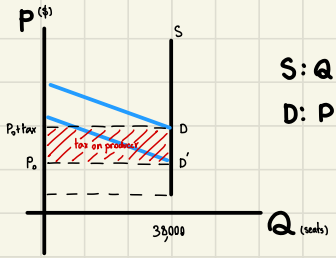
HW#6 Due October 6, 2020

9. At Fenway Park, home of the Boston Red Sox, seating is limited to about 38,000. Hence, the number of tickets issued is fixed at that figure. Seeing a golden opportunity to raise revenue, the City of Boston levies a per ticket tax of $5 to be paid by the ticket buyer. Boston sports fans, a famously civic-minded lot, dutifully send in the $5 per ticket. Draw a well-labeled graph showing the impact of the tax. On whom does the tax burden fall—the team's owners, the fans, or both? Why?



S: $Q = 38{,}000$

D: $P = b - mQ$

At price P_0 is the price the consumer wish to pay (before tax)

At price P_0+tax is the price the consumer must pay for tickets.

According to the graph, due to the seats at Fenway Park are fixed at 38,000 seats then the supply curve is perfectly inelastic. Assuming a normal demand curve, a tax on consumers shifts the demand curve down vertically equal to the amount of tax, $5.

Without tax:

the equilibrium price will be (P_0+tax). This is the amount that consumer and producer agree to have a deal initially. Consumers will pay at price (P_0+tax) and producer will receive at the full value that consumers paid.

With tax;

the equilibrium price will be (P_0.) The change in equilibrium happen because the drop in demand curve caused by the tax. The consumers wish to pay less because they know the amount that they need to pay is higher, which is no good for them so they wish to pay less but same get the same amount. (demand curve shift)

- since the demand shifts downward by $5, the amount that consumers will pay to produce is reduced by $5 at new equilibrium because the consumers have to spare $5 for the tax.

∴ The total amount that the consumers must pay is at price (P_0+tax) — the same as the former price at the without-tax equilibrium.

but the total amount that producers will receive is at price (P_0) — not the same as before.

∴ tax completely burden on producers because the curve is inelastic — the producer cannot do much in response to change in price.

10. A market is described by the following supply and demand curves:

$$Q^S = 2P$$
$$Q^D = 300 - P$$

$P = \frac{Q}{2}$

$P = 300 - Q$

a. Solve for the equilibrium price and quantity.

b. If the government imposes a price ceiling of \$90, does a shortage or surplus (or neither) develop? What are the price, quantity supplied, quantity demanded, and size of the shortage or surplus?

c. If the government imposes a price floor of \$90, does a shortage or surplus (or neither) develop? What are the price, quantity supplied, quantity demanded, and size of the shortage or surplus?

d. Instead of a price control, the government levies a tax on producers of \$30. As a result, the new supply curve is:

$$Q^S = 2(P - 30).$$ $P = \frac{Q}{2} + 30$

Does a shortage or surplus (or neither) develop? What are the price, quantity supplied, quantity demanded, and size of the shortage or surplus?

a.) At equilibrium price : $Q_D = Q_S$

$$\frac{Q}{2} = 300 - Q$$

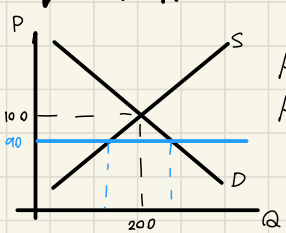
$Q = 2P$

$\therefore P = 100$

$$\frac{3}{2}Q = 300$$
$$Q = 200$$

$\therefore$ the equilibrium price and quantity will be 100\$ and 200 units.

b.) There will be a shortage if the goverment set a price ceiling at 90\$ because the quantity supplied is less than the quantity demand.



At price 90\$ quantity supplied will be $Q = 2(90) = 180$ units.

At price 90\$ quantity demanded will be $Q = 300 - 90 = 210$ units.

$\therefore$ The size of shortage is $210 - 180 = 30$ units.

c.) Nothing will happen. Neither surplus nor shortage will occur because the quantity supplied and quantity demanded stay the same if the goverment set price ceiling at 90\$.

d.) Levying tax on producers of 30\$

new Eq; $Q_S = Q_D$

$\frac{Q}{2} + 30 = 300 - Q$

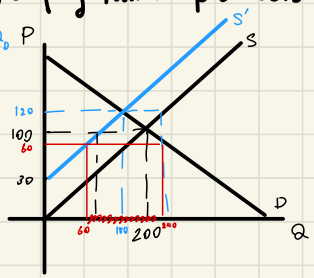
$\frac{3}{2}Q = 270$

$Q = 180$

plug $Q = 180$ in

$P = \frac{180}{2} + 30$

$= 120$



plug $P = 120$ in

$P = \frac{Q}{2} = 120 = \frac{Q}{2}$

$Q = 240$

plug $Q = 240$ in

$P = 300 - Q$

$= 300 - 240$

$= 60$

plug $P = 60$ in

$P = \frac{Q}{2} + 30$

$(60 - 30) = \frac{Q}{2}$

$Q = 60$

The new equilibrium will create the shortage at the price \$100.

At price \$ 60 the quantity demanded is 240 units

At price \$ 60 the quantity supplied is 60 units

$\therefore$ The size of shortage will be $240 - 60 = 180$ units.