

Question 1

a) At Equilibrium;

$$\text{Price} = \text{Quantity}$$

$$\text{Equilibrium Price} = 20$$

$$\text{Equilibrium Quantity} = 600$$

b) If Price (P) = 25

$$\text{Quantity (Q)} = ?$$

from the diagram, when $P = 25$, $Q = 800$

c) If Price (P) = 15

from the diagram,

$$\text{when } P = 15, \text{ Quantity (Q)} = 400$$

d) At Price (P) = 10

$$\text{Quantity} = 200$$

Equilibrium price and quantity is 25 and 800 respectively.

Therefore; at $P = 10$, 800 quantity is demanded but only 100 can be supplied therefore causing a Shortage.

$$\text{Shortage} = D > S$$

$$= 800 - 100$$

$$= 700$$

e) When government sets price at 15

This is way below the equilibrium price.

Quantity demanded will be more than quantity supplied;
hence a shortage will be created.

Shortage = D > S i.e. Demand is greater than Supply.

Question 2

a) Current price is charged at 5.

b) At $P = 5$, Adults attending show are 50

At $P = 5$, Children attending show are 20

Total Revenue (TR) = Price $\times$ Quantity

$$= (5 \times 50) + (5 \times 20)$$

$$250 + 100$$

$$= \underline{\underline{350}}$$

c) The Children market is more elastic than the adults market

A 1% unit change in price leads to a more than 1% change in the quantity demanded.

d) The adult market is more inelastic than the children market. A 1% change in unit price leads to a less than 1% change of the quantity demanded.

Question 2 Continuation

e) $E_d = \frac{\% \text{ Change in Quantity demanded}}{\% \text{ Change in Price}}$

$$= \frac{Q_2 - Q_1}{(Q_2 + Q_1)/2} \div \frac{P_2 - P_1}{(P_2 + P_1)/2}$$

$$= \frac{60 - 50}{(60 + 50)/2} \div \frac{2 - 5}{(2 + 5)/2}$$

$$= \frac{10}{55} \div \frac{-3}{3.5}$$

$$= \frac{10}{55} \times \frac{3.5}{-3} = \frac{35}{-165} = -0.212 \times 100 = \underline{\underline{-21.2\%}}$$

f) $E_d = \frac{\% \text{ Change in Quantity demanded}}{\% \text{ Change in Price}}$

$$= \frac{Q_2 - Q_1}{(Q_2 + Q_1)/2} \div \frac{P_2 - P_1}{(P_2 + P_1)/2}$$

$$= \frac{40 - 20}{(40 + 20)/2} \div \frac{3 - 5}{(3 + 5)/2}$$

$$= \frac{20}{30} \div \frac{-2}{4}$$

$$= \frac{20}{30} \times \frac{4}{-2} = \frac{4}{-3} = -1.33 \times 100 = \underline{\underline{-133.3\%}}$$

- g) When adult ticket = 8,
children ticket = 3

$$\begin{aligned} TR &= PQ \\ &= (8 \times 40) + (3 \times 40) \\ &= 320 + 120 \\ &= \underline{\underline{440}} \end{aligned}$$

Question 3

Price	Quantity demanded	Total Revenue (PQ)	Ed (g)
6	1	6	-45.45
5	2	10	-180
4	3	12	-100
3	4	12	-55.56
2	5	10	-27.27
1	6	6	

Question 4

- a) At point B, $P=6$, and $Q=200$
Point C, $P=8$ and $Q=250$

$$E_s = \frac{\% \text{ Change in Quantity}}{\% \text{ Change in Price}}$$

$$= \frac{250 - 200}{(250 + 200)/2} \div \frac{8 - 6}{(8 + 6)/2}$$

$$= \frac{50}{225} \div \frac{2}{7}$$

$$= \frac{50}{225} \times \frac{7}{2} = \frac{7}{9} = 0.77777 \times 100 = \underline{\underline{77.77\%}}$$

b) At equilibrium price 6.

~~Equilibrium~~ Supply will be 200

$$\begin{aligned} TR &= \text{Price} \times \text{Quantity} (PQ) \\ &= 6 \times 200 \\ &= \underline{\underline{1200}} \end{aligned}$$

c) At equilibrium price 8.

$$\begin{aligned} TR &= 8 \times 250 \\ &= 2000 \end{aligned}$$

% change:

$$\frac{(2000 - 1200)}{1200} \times 100 = \frac{800}{1200} \times 100 = \underline{\underline{66.67\%}}$$

d)

Question 5

a) Cross elasticity of demand formula:

$$E_{xy} = \left(\frac{\Delta Q_x / Q_x}{\Delta P_y / P_y} \right) \times 100$$

b) Hot dogs = X

mustard = Y.

$$E_{xy} = -2.$$

$$= -2 = \frac{40}{20}$$

$$= -2 \times 20 = -40$$

$$Y = -20\%$$

Therefore, Quantity of mustard decreases by 20%.

c)

Income elasticity of demand formula:

$$P_{ED} = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Income}}$$

d)

When $P_{ED} = 3$, 10 tickets.

Income increases by 20%.

$$3.0 = \frac{?}{20}$$

$$= 3.0 \times \frac{?}{20}$$

$$= ? = 60$$

After price increase; Tickets demanded will be 60 in number.

Workings Question 3b.
Elasticity of demand:

$$P_1 = 6 \quad Q_1 = 1$$

$$P_2 = 5 \quad Q_2 = 2$$

$$= \frac{(Q_2 - Q_1)}{(Q_2 + Q_1)/2} \div \frac{P_2 - P_1}{(P_2 + P_1)/2}$$

$$= \frac{5 - 6}{(5 + 6)/2} \div \frac{2 - 1}{(2 + 3)/2}$$

$$= \frac{-1}{5.5} \div \frac{1}{2.5}$$

$$= \frac{-1}{5.5} \times \frac{2.5}{1} = \frac{-2.5}{5.5} = 0.4545 \times 100 = -45.45\%$$

$$P_1 = 5 \quad Q_1 = 2$$

$$P_2 = 4 \quad Q_2 = 3$$

$$= \frac{3 - 2}{(3 + 2)/2} \div \frac{4 - 5}{(4 + 5)/2}$$

$$= \frac{1}{2.5} \div \frac{-1}{4.5}$$

$$= \frac{1}{2.5} \times \frac{4.5}{-1} = \frac{4.5}{-2.5} = -1.8 \times 100 = -180\%$$

$$P_1 = 4 \quad Q_1 = 3$$

$$P_2 = 3 \quad Q_2 = 4$$

$$= \frac{4 - 3}{(4 + 3)/2} \div \frac{3 - 4}{(3 + 4)/2}$$

$$= \frac{1}{3.5} \div \frac{-1}{3.5} = \frac{1}{3.5} \times \frac{3.5}{-1} = -1 \times 100 = -100\%$$

$$p_1 = 3 \quad q_1 = 4$$

$$p_2 = 2 \quad q_2 = 5$$

$$= \frac{5-4}{(5+4)/2} \div \frac{2-3}{(2+3)/2}$$

$$= \frac{1}{4.5} \div \frac{-1}{2.5}$$

$$= \frac{1}{4.5} \times \frac{2.5}{-1} = \frac{2.5}{-4.5} = -0.5555 \times 100 = -55.56\%$$

$$p_1 = 2 \quad q_1 = 5$$

$$p_2 = 1 \quad q_2 = 6$$

$$= \frac{6-5}{(6+5)/2} \div \frac{1-2}{(1+2)/2}$$

$$= \frac{1}{5.5} \div \frac{-1}{1.5}$$

$$= \frac{1}{5.5} \times \frac{1.5}{-1} = \frac{1.5}{-5.5} = -0.2727 \times 100 = -27.27\%$$