Answer on Question 71151-Economics - Microeconomics

In a particular town there are 100 cars and 50 motorcycles. Each car owner has a demand curve for petrol given by: Qdc = 20 – 5p for p ≤ 4 and Qdc = 0 for p > 4. Each motorcycle owner has the following demand function for petrol: Qdm = 15 – 3p for p ≤ 5 and Qdm = 0 for p > 5. Prices are expressed as £ per gallon, and quantities as gallons per week.

a. If the price is £3, now many gallons of petrol per week are bought by (i) each car owner and (ii) each motorcycle owner?

b. Sketch the market demand curve for petrol (that is, the combined demand from car and motorcycle owners).

c. Write an algebraic expression for the market demand function.

Solution.

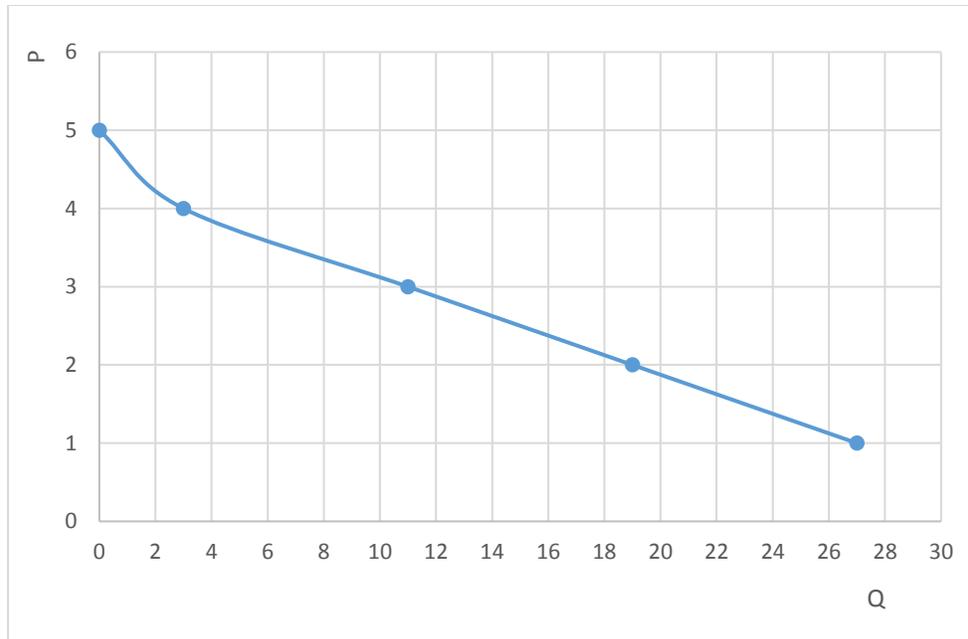A. **If the price is £3**, each car owner will buy

$$Q = 20 - 5 \times 3 = 5\ gallons$$

Each motorcycle owner will buy

$$Q = 15 - 3 \times 3 = 6\ gallons$$

B. **To sketch the market demand let's fill the table below**

20-5p				15-3p			Total demand	
Q	P			Q	P		Q	P
15	1			12	1		27	1
10	2			9	2		19	2
5	3			6	3		11	3
0	4			3	4		3	4
0	5			0	5		0	5

C. **Algebraic expression** for the market demand function is

$$Qd = 20 - 3P + 15 - 3P = 35 - 6P \text{ for p} < 4;$$

$$Qd = 15 - 3P \quad \text{for } 4 \leq p \leq 5;$$

$$Qd = 0 \quad \text{for p} > 5.$$