Exercises

MARKET

Calculating market equilibria

Consider a perfectly competitive market for a normal good where the demand for the good at each price is equal to $Q_D = 66 - p$ and the supply is equal to $Q_S = p/2$

Explain why the slope of the demand curve is negative

Explain why the slope of the supply curve is positive

For each of the following prices: 40, 46, 50, what is the market outcome?

Find the equilibrium quantity and price for the following cases:

i. free market

ii. an upper price limit of 36

iii. an upper price limit of 48

iv. a lower price limit of 56

v. an increase in demand to $Q_D = 78 - p$

Green paradox

- Encouraging people to switch from buying an ICE car to buying an EV could crowd out other buyers from the EV market, who would switch to ICE; in the end, the car mix would not change

- Consider two types of buyers: buyers A are already quite motivated to buy an EV, whereas the WTP of buyers B is low:

- Demand of group A: $Q_A = 3 - p/2$; demand of group B: $Q_B = 3 - p$

- Supply of EV: $Q_S = -9 + 3p$

- Represent the market for EV and calculate its equilibrium before any support measure

Green paradox – market without support

Demand of group A: $Q_A = 3 - p/2$ Demand of group B: $Q_B = 3 - p$
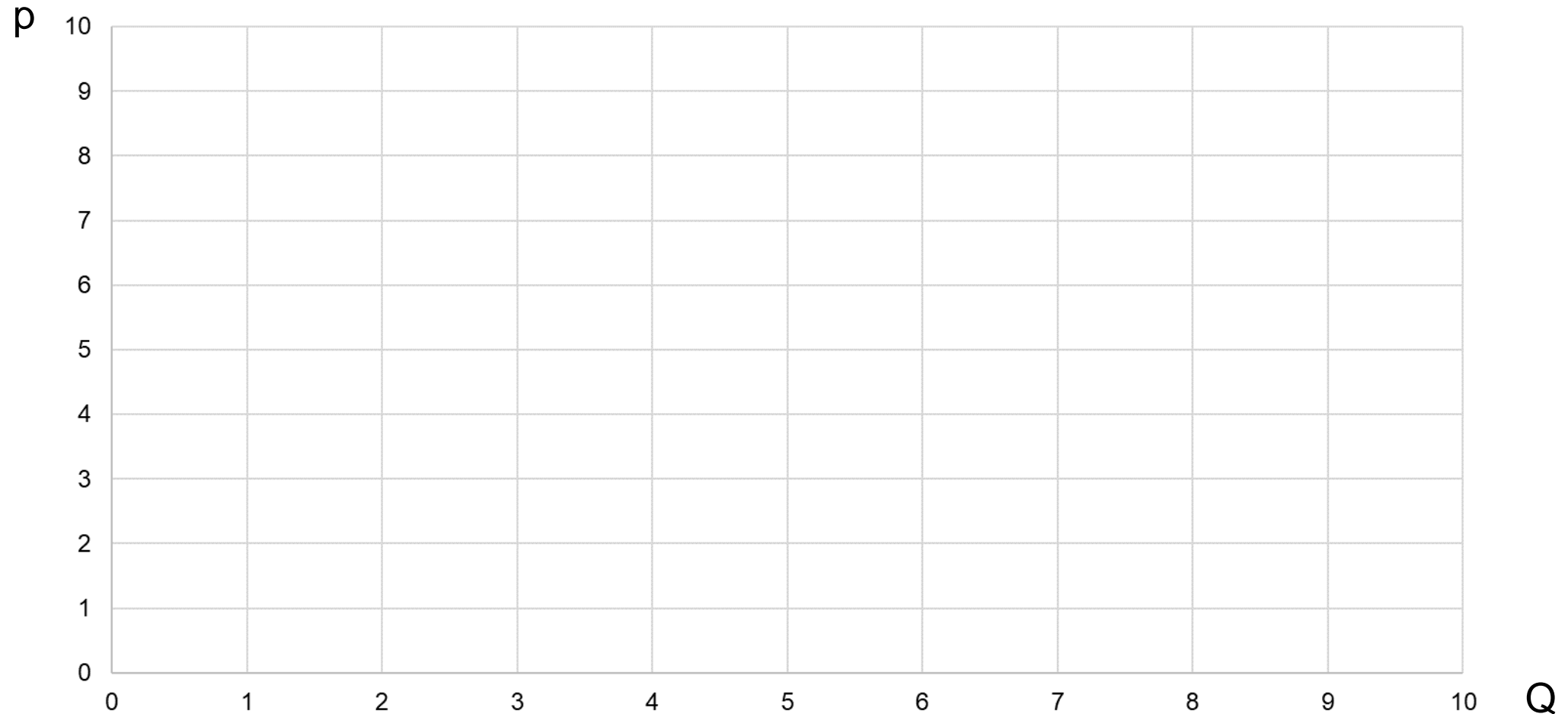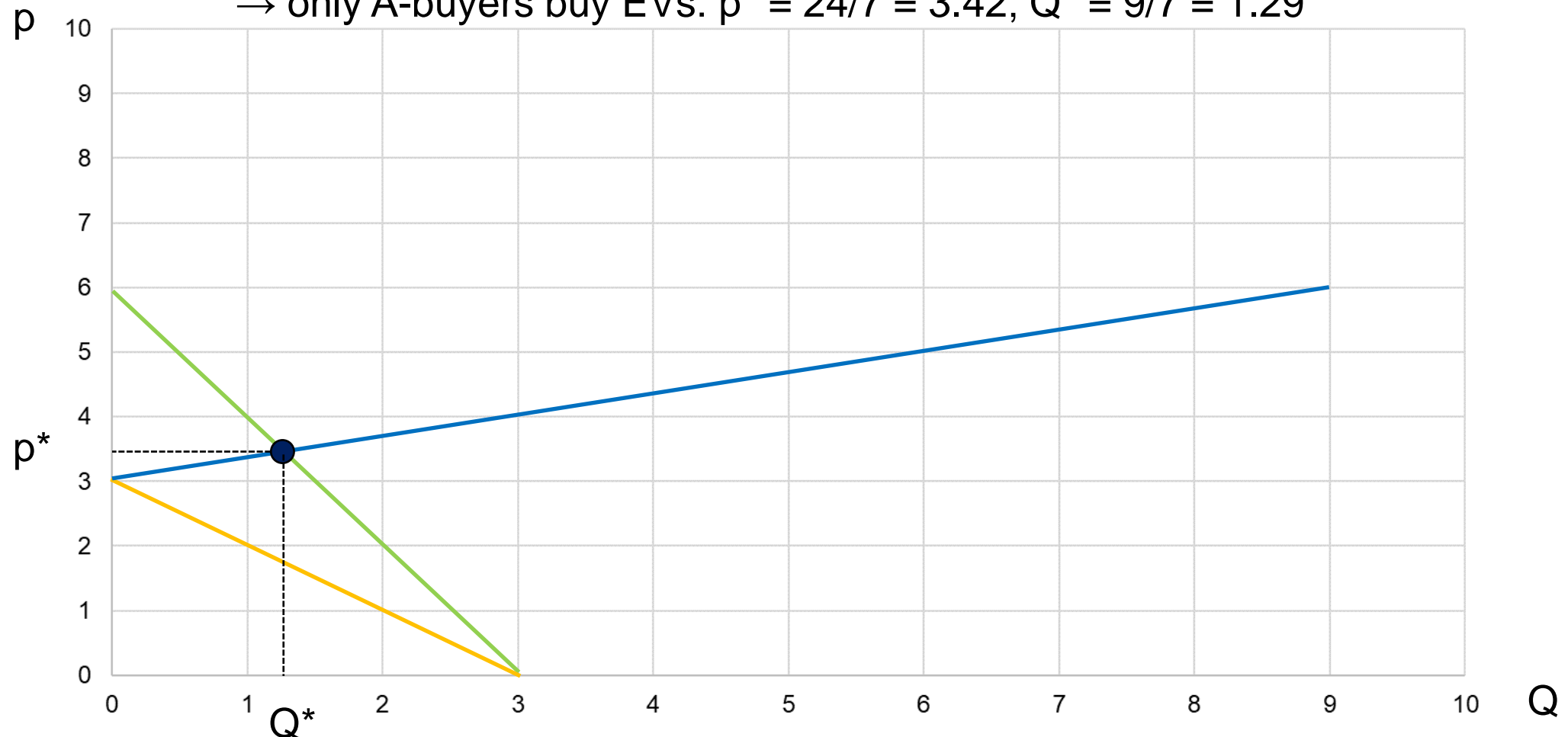
Supply: $Q_S = -9 + 3p$

Green paradox – market without support

Demand of group A: $Q_A = 3 - p/2$ Demand of group B: $Q_B = 3 - p$

Supply: $Q_S = -9 + 3p$

$\rightarrow$ only A-buyers buy EVs: $p^* = 24/7 = 3.42$; $Q^* = 9/7 = 1.29$

Green paradox

- Let us now assume that the purchase of EVs is encouraged through a fixed financial contribution (subsidy) of 2 per car

- How does this change the demand functions?

Green paradox – demand with support

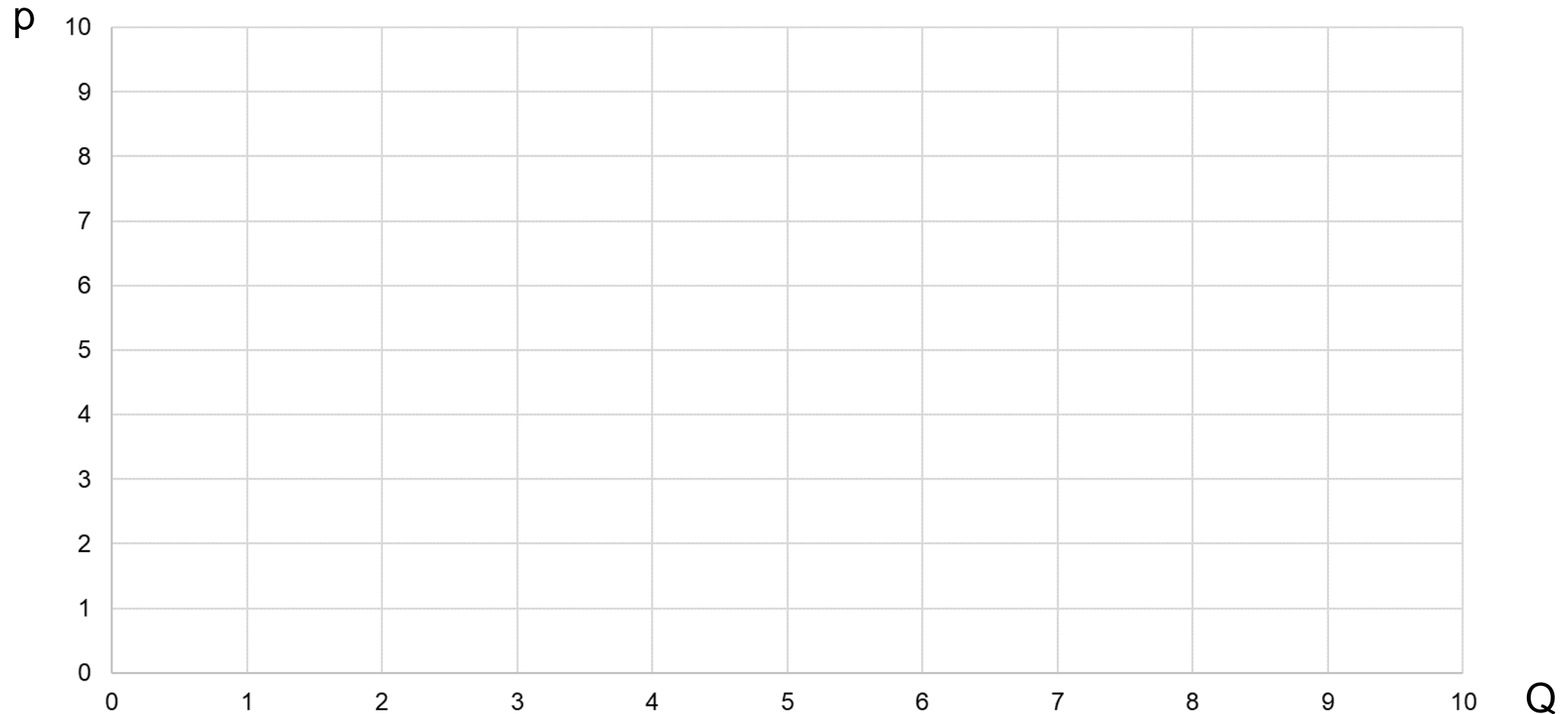Without subsidy:

Demand of group A: $Q_A = 3 - p/2$ Demand of group B: $Q_B = 3 - p$

With subsidy:

Demand of group A: Demand of group B:

Green paradox – demand with support

<u>Without</u> subsidy:
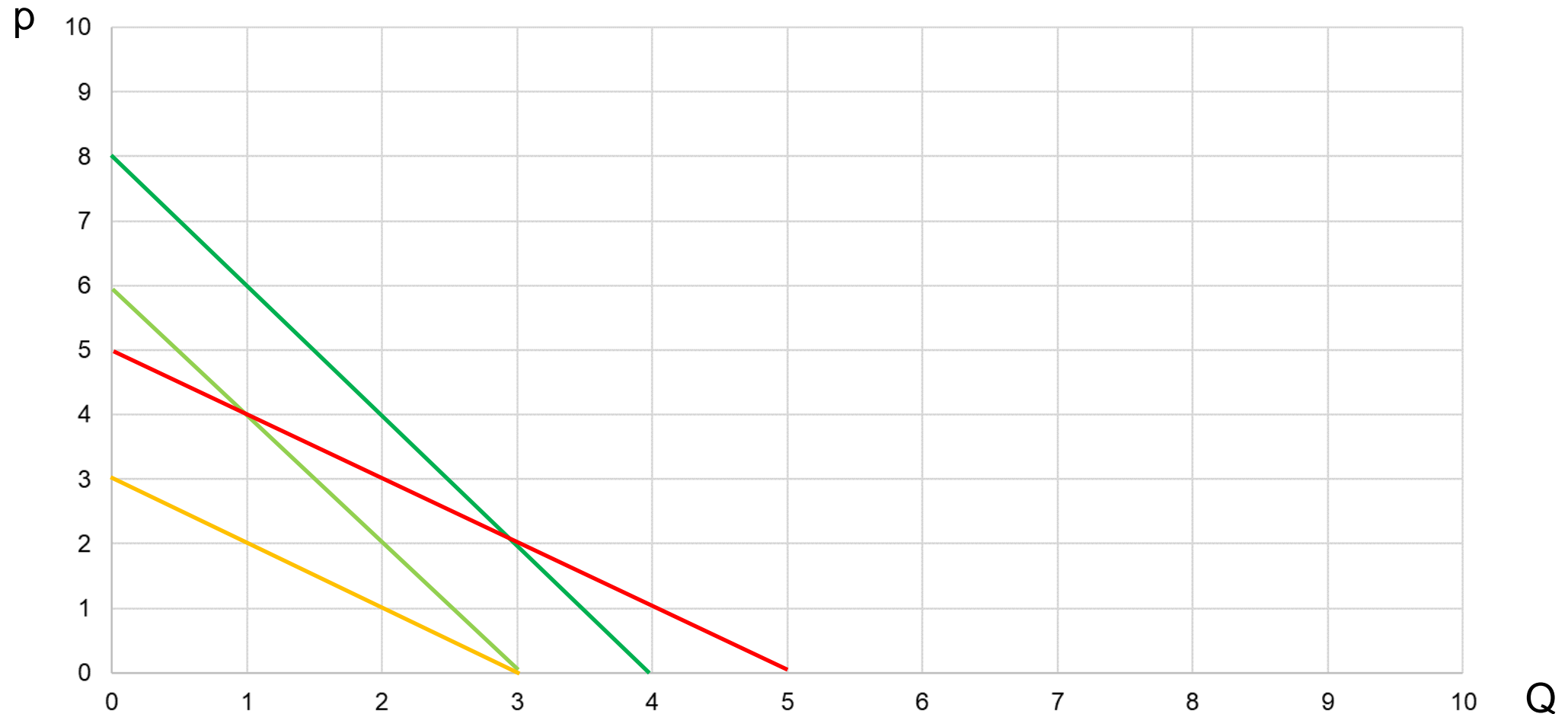
Demand of group A: $Q_A = 3 - p/2$ Demand of group B: $Q_B = 3 - p$

<u>With</u> subsidy:

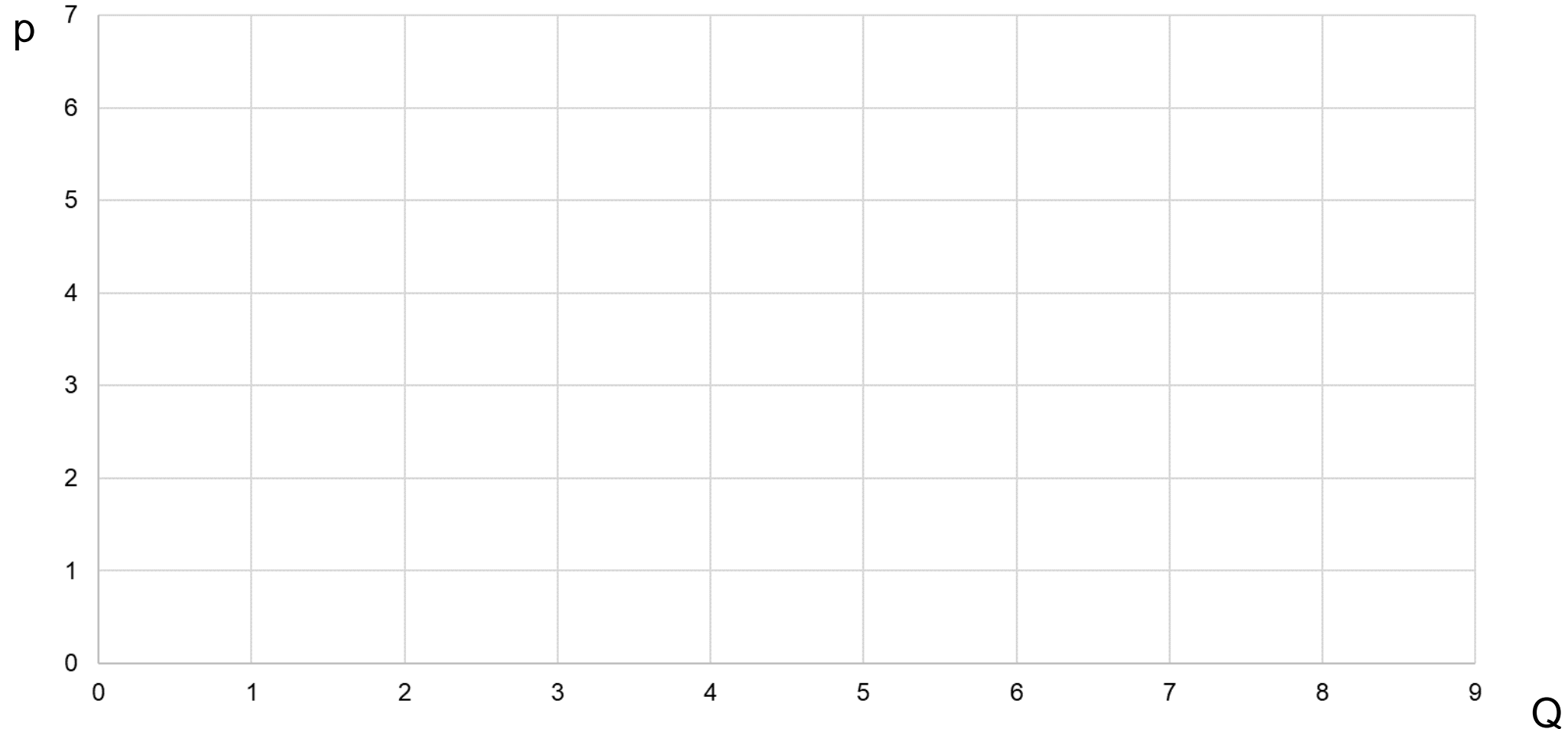Demand of group A: $Q_A = 4 - p/2$ Demand of group B: $Q_B = 5 - p$

- With the new demands and the unchanged supply, represent the market for EV and calculate its equilibrium with the support measure

Green paradox – market with <u>with</u> support

Demand of group A: $Q_A = 4 - p/2$ Demand of group B: $Q_B = 5 - p$

Supply: $Q_S = -9 + 3p$
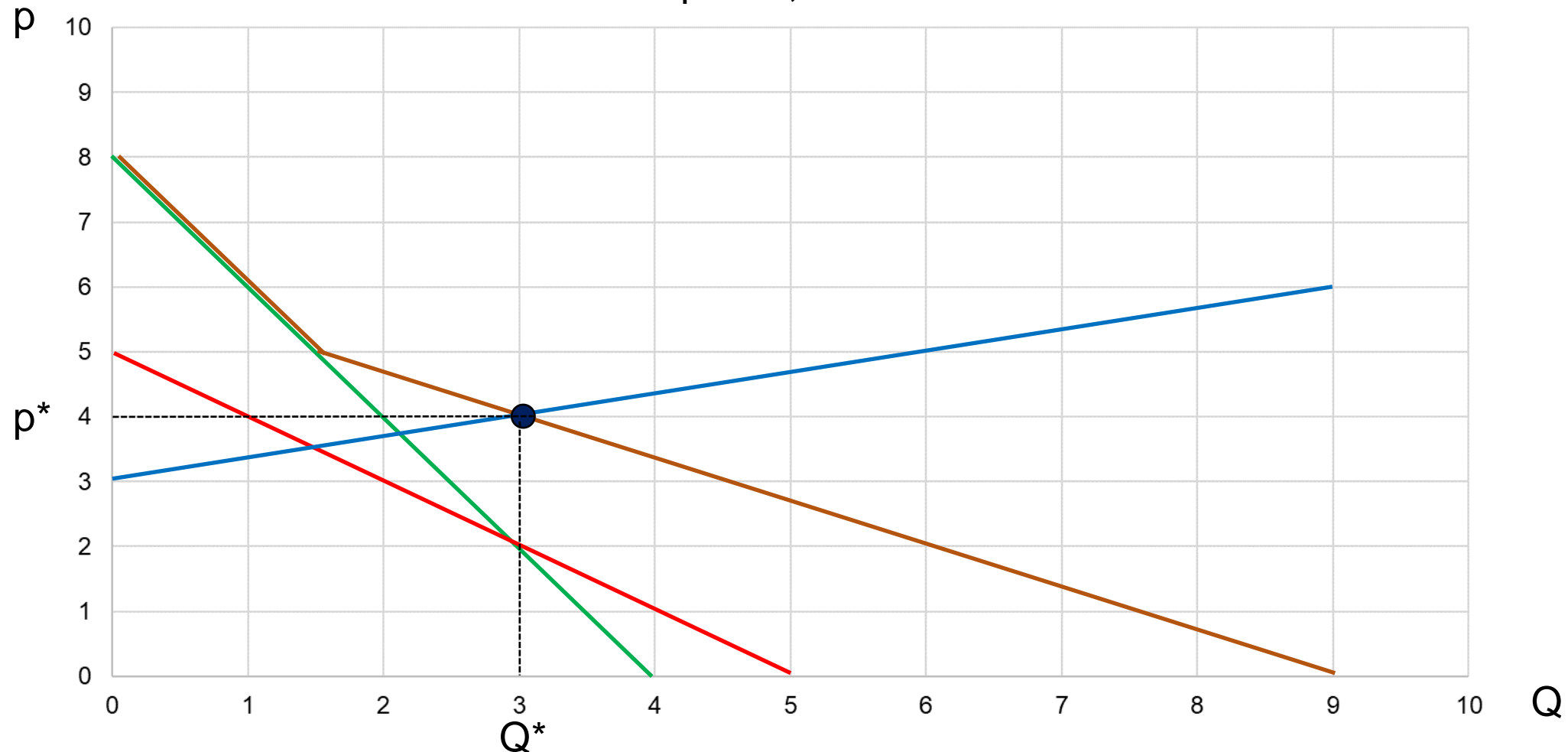
Green paradox – market <u>with</u> support

Demand of group A: $Q_A = 4 - p/2$ Demand of group B: $Q_B = 5 - p$

Supply: $Q_S = -9 + 3p$

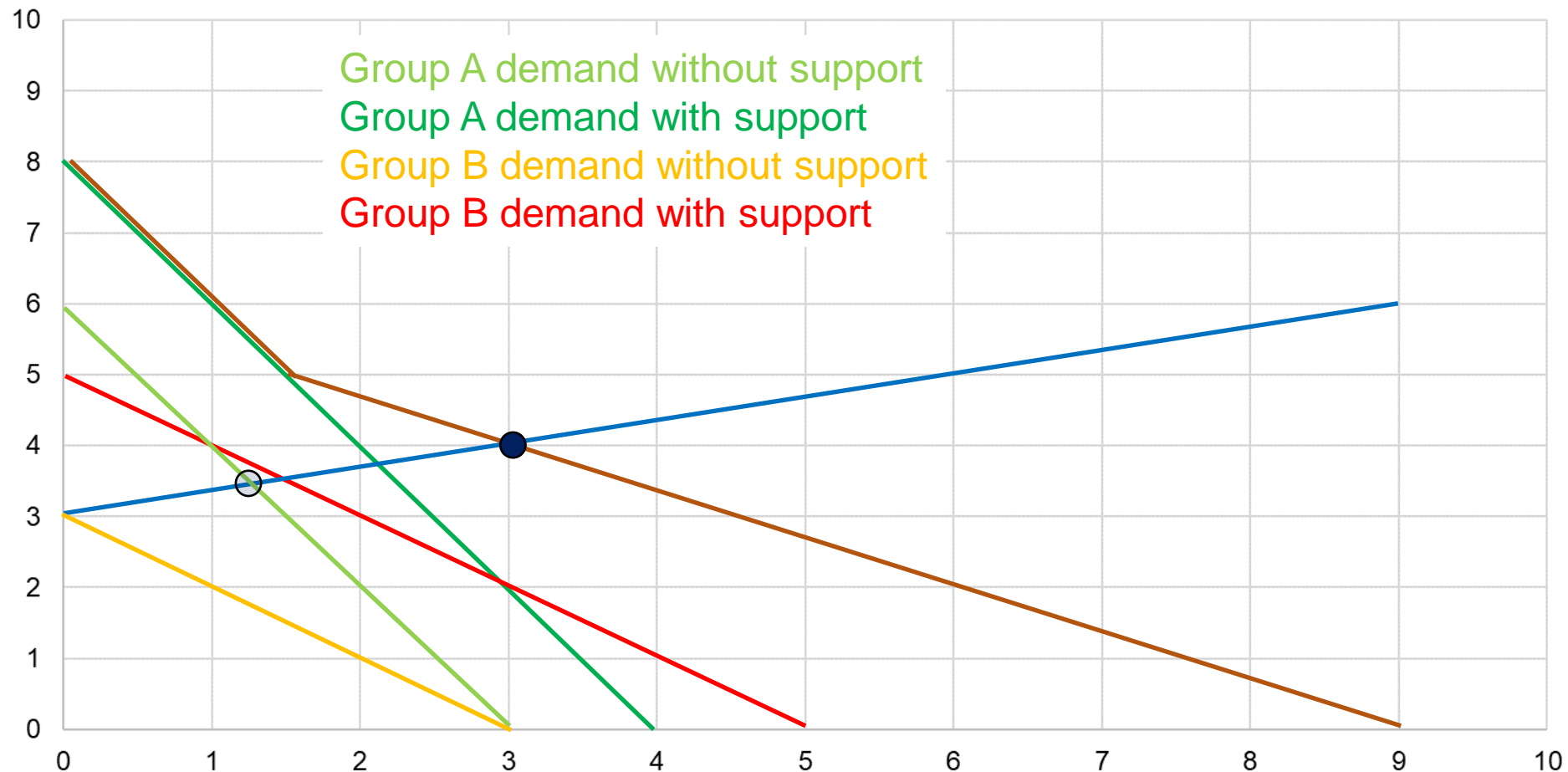Total demand: $Q_{tot}(p) = Q_A(p) + Q_B(p) = 9 - 3p/2$

$\rightarrow p^* = 4;\ Q^* = 3$

Green paradox – market <u>with</u> support

Interpretation:

- One buyer out of three is a B-buyer
- More A-buyers buy EVs than without support, despite higher price → no green paradox
- Many A-buyers enjoy a 'windfall gain' ('*effet d'aubaine*', '*Mitnahmeeffekt*')

Green paradox – only B-buyers get support

Interpretation:

- If A-buyers do not get the support, some are crowded out by higher price → small green paradox
- No windfall gains … but discrimination