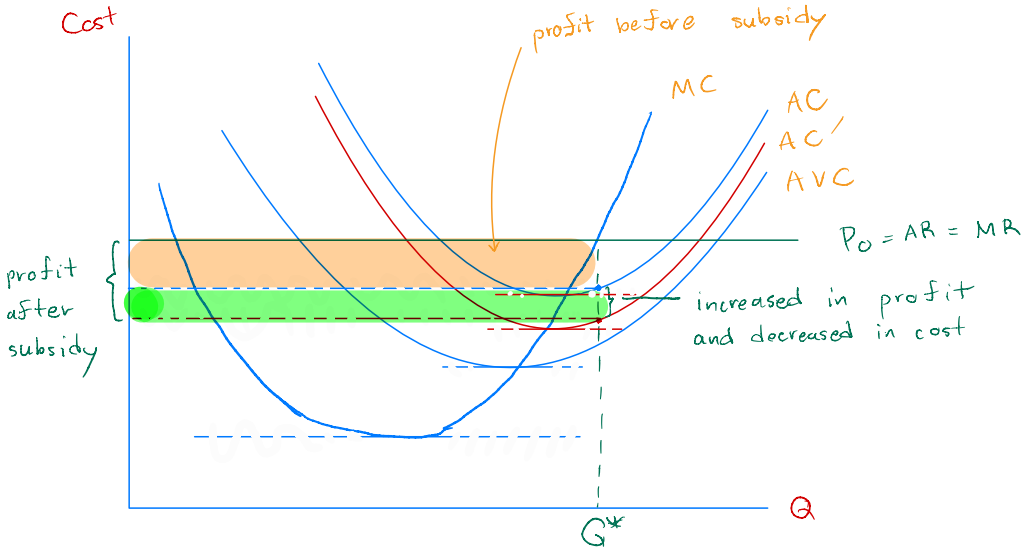
HW#11, Due May 6, 2021 Analyze the case the firm receives subsidy for the following two different cases to find out how the firm's quantity and profit change.
a) The government gives a lump sum subsidy of 20,000 bahts to each firm.
b) Suppose that the firm was producing 1,000 units and the government gives a subsidy of 20 bahts/unit so the total subsidy is also 20,000 bahts if the firm does not change its production of 1,000 units. Do you think, to maximize its profit with the subsidy of 20 bahts/unit, the firm will increase/decrease its production from 1,000 units? Does the firm receive higher profit? Does the firm receive more/less subsidy than 20,000 bahts?

a.) $TC(Q) = TFC(Q) + TVC(Q)$; original.

Let $TFC'(Q) = TFC(Q) - \text{subsidy}$

Then $TC'(Q) = TFC'(Q) + TVC(Q)$



Therefore, the firm will produce at the same quantity at Q^* because only AC decreased (shift downward) but MC and MR remain the same.

In addition, the profit will increase for 20,000 Baht.

b.)

$$TC(Q) = TFC(Q) + TVC(Q)$$

$$TC'(Q) = TFC(Q) + \boxed{TVC'(Q)}$$

$$= TFC(Q) + \boxed{TVC(Q) - 20Q}$$

$$AC'(Q) = AFC(Q) + AVC(Q) - 20 = AC(Q) - 20$$

$$TVC'(Q) = TVC(Q) - 20Q$$

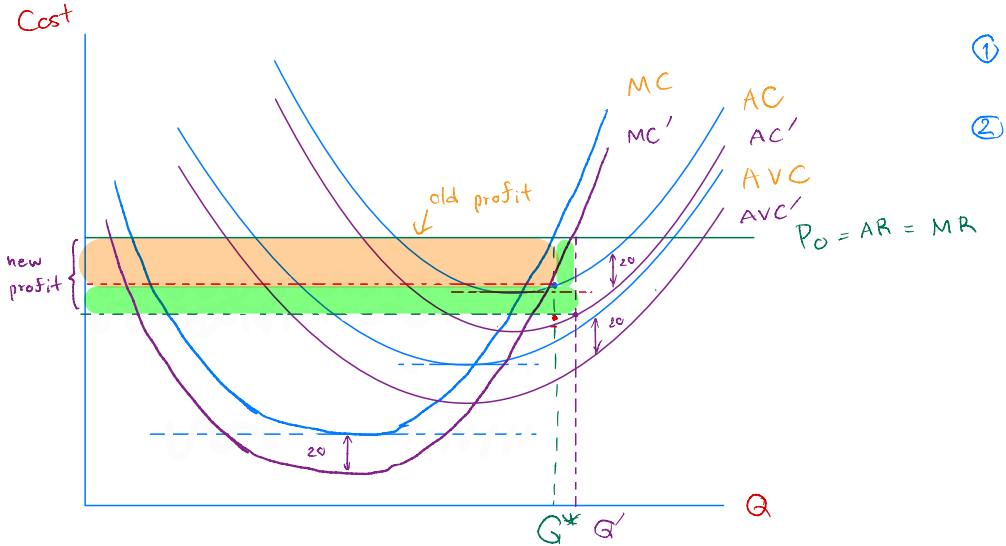
$$MC'(Q) = MC(Q) - 20$$

After subsidy

Equilibrium condition

① $MC'(Q') = MR(Q')$

② slope of $MR(Q')$ < slope of $MC'(Q')$



Therefore, if the company want to maximize profit, they have to increases in quantity from Q^* to Q'. (> 1000)

Then, the profit after subsidy would be $P_0Q' - AVC'G'$

at the end, the firms receive more profit and subsidy because the firm would be able to sell more of its product at the same price.