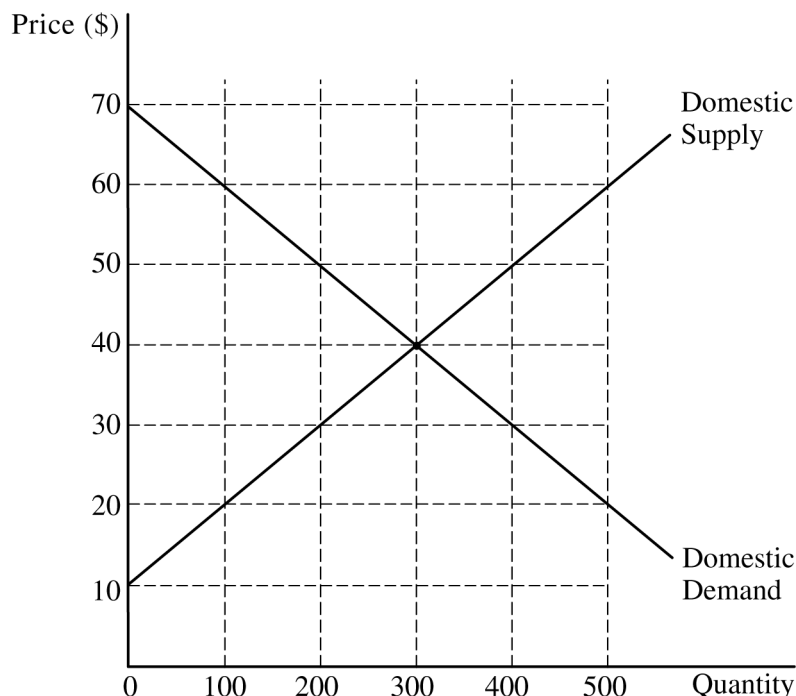


1. Sugar is produced in a perfectly competitive market using inputs from perfectly competitive factor markets. Frank Sugar Co. is a representative firm in the sugar market.
- (a) Assume Frank Sugar Co. is earning zero economic profit. Draw correctly labeled side-by-side graphs for the sugar market and Frank Sugar Co. and show each of the following.
- (i) The market equilibrium price and quantity, labeled  $P_M$  and  $Q_M$ , respectively
  - (ii) The profit-maximizing price and quantity for Frank Sugar Co., labeled  $P_F$  and  $Q_F$ , respectively
- (b) Assume the demand for sugar increases and sugar is produced in a constant-cost industry.
- (i) On your graph in part (a), show the short-run effect of the increased demand for sugar on the market price, labeled  $P_2$ , and the quantity sold by Frank Sugar Co., labeled  $Q_N$ .
  - (ii) Compared to the equilibrium identified in part (a)(ii), what will happen to the short-run profit earned by Frank Sugar Co. as a result of the increased demand for sugar?
  - (iii) When the market adjusts to long-run equilibrium, how will the market price of sugar in the long run compare to  $P_2$ ? Explain.
- (c) Instead, assume sugar consumption has a negative impact on public health over time and the negative impact of sugar on health is underestimated by consumers. Draw a correctly labeled graph of the market, with the marginal social benefit (MSB), marginal private benefit (MPB), marginal social cost (MSC), and marginal private cost (MPC) curves, and show each of the following.
- (i) The market equilibrium quantity, labeled  $Q_M$
  - (ii) The socially optimal quantity, labeled  $Q_S$
- (d) Assume the government decides to intervene in the market to affect consumers' incentives and to address the negative impact of sugar consumption on public health. Which of the following policies would best achieve that objective in the short run: a lump-sum tax, a per-unit tax, a lump-sum subsidy, or a per-unit subsidy? Explain.

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**Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.**



2. The graph provided depicts New Zealand's domestic supply and demand for wool.

(a) Calculate the consumer surplus if New Zealand does not trade with the rest of the world. Show your work.

(b) Instead, assume New Zealand decides to trade wool in the world market. The current world price of wool is \$60 per unit, and New Zealand is a price taker in the world market.

(i) How many units of wool will New Zealand export?

(ii) What will happen to the consumer surplus of wool consumers in New Zealand when New Zealand begins to trade with the rest of the world? Explain.

(iii) Will total economic surplus in New Zealand increase, decrease, or remain unchanged when New Zealand begins to trade wool in the world market? Explain using numbers.

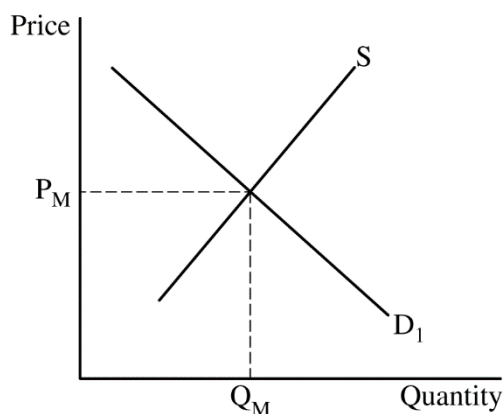
(c) Now assume domestic demand in New Zealand increases. Will New Zealand's exports increase, decrease, or stay the same?

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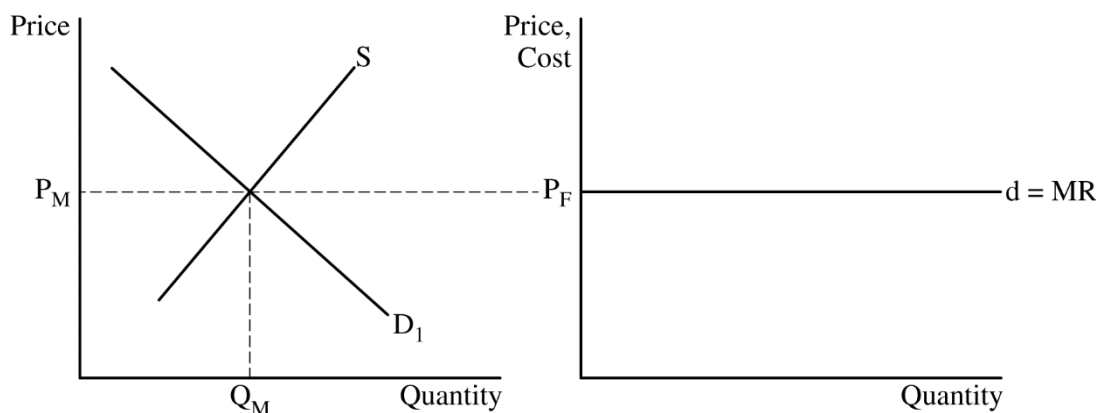
**Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.**

**Question 1: Long****10 points**

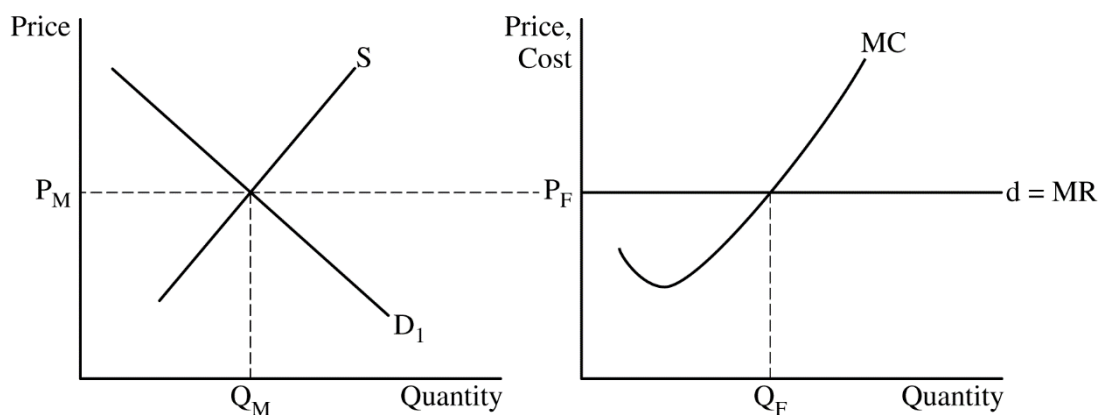
- (a) Draw a correctly labeled graph of the market for sugar and show the equilibrium price and quantity, labeled  $P_M$  and  $Q_M$ , respectively. **1 point**



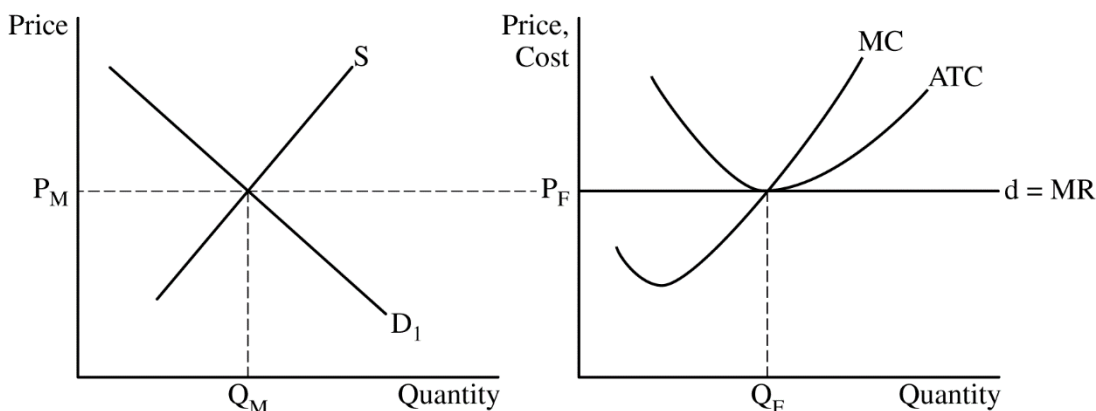
- For the second point, the graph must show a horizontal demand curve ( $d = MR$ ) for Frank Sugar Co. and label the firm's profit-maximizing price  $P_F$  at  $P_M$ . **1 point**



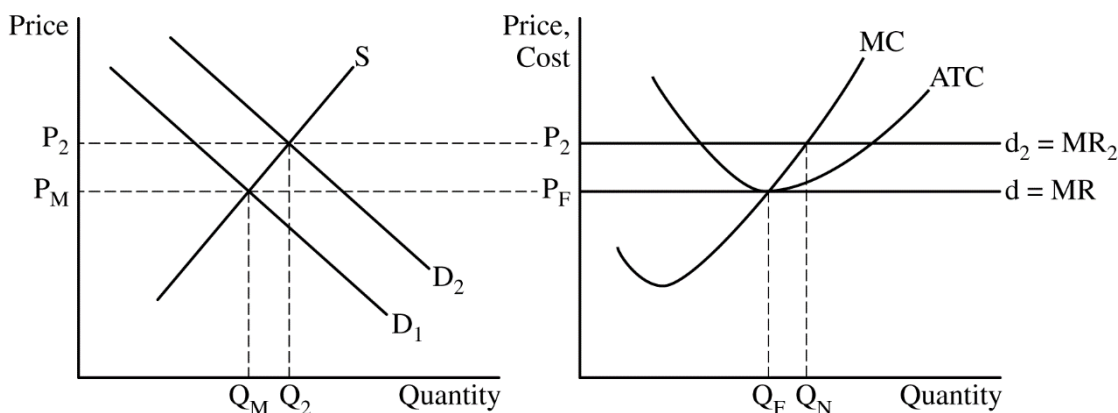
- For the third point, the graph must show the marginal cost ( $MC$ ) curve and show the profit-maximizing quantity, labeled  $Q_F$  where  $MR = MC$ . **1 point**



For the fourth point, the firm's graph must show the average total cost (ATC) curve tangent to the firm's demand curve at  $Q_F$  and show the MC curve passing through the minimum point of the ATC curve.

**1 point****Total for part (a) 4 points**

- (b) On your market graph from part (a), show a rightward shift in the market demand curve with a higher market price, labeled  $P_2$ , and show an upward shift in the firm's demand curve with a greater quantity sold by Frank Sugar Co., labeled  $Q_N$ .

**1 point**

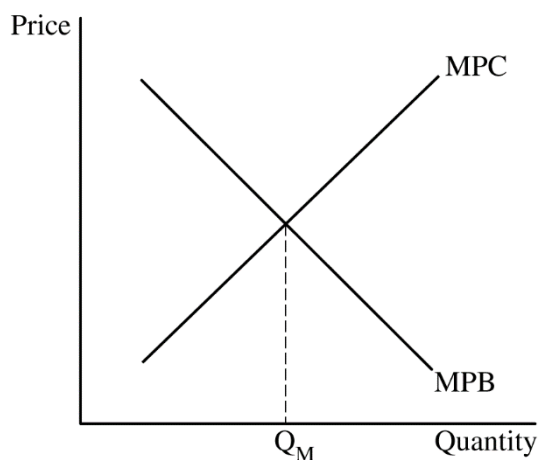
State that the profit earned by Frank Sugar Co. will increase in the short run.

**1 point**

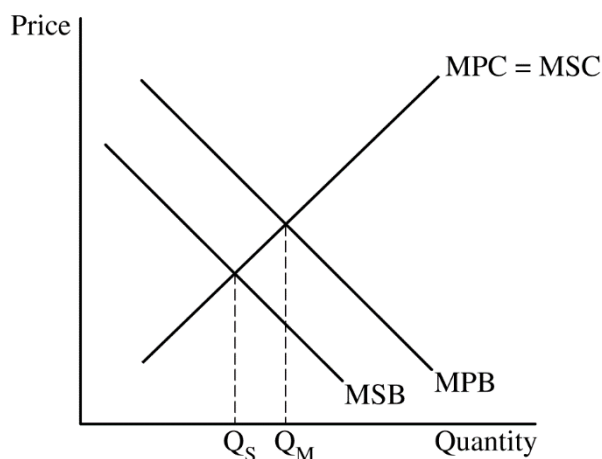
State that the market price in long-run equilibrium will be lower than  $P_2$  and explain that new firms will enter the market, which increases the market supply, lowering the market price back to  $P_M$  where firms earn zero economic profit in the long run.

**1 point****Total for part (b) 3 points**

- (c) Draw a correctly labeled graph with an upward-sloping supply curve, labeled MPC, a downward-sloping demand curve, labeled MPB, and show the market equilibrium quantity, labeled  $Q_M$  at the intersection of the MPB and MPC curves.

**1 point**

- For the second point, the graph must show a downward-sloping marginal social benefit (MSB) curve below the MPB curve, label the upward sloping curve  $MPC = MSC$ , and show the socially optimal quantity, labeled  $Q_S$ , at the intersection of the MSB and MSC curves.

**1 point****Total for part (c) 2 points**

- (d) State that the government would impose a per-unit tax and explain that the tax would raise the price paid per unit **AND** decrease market equilibrium quantity to move it closer to the socially optimal quantity.

**1 point****Total for question 1 10 points**