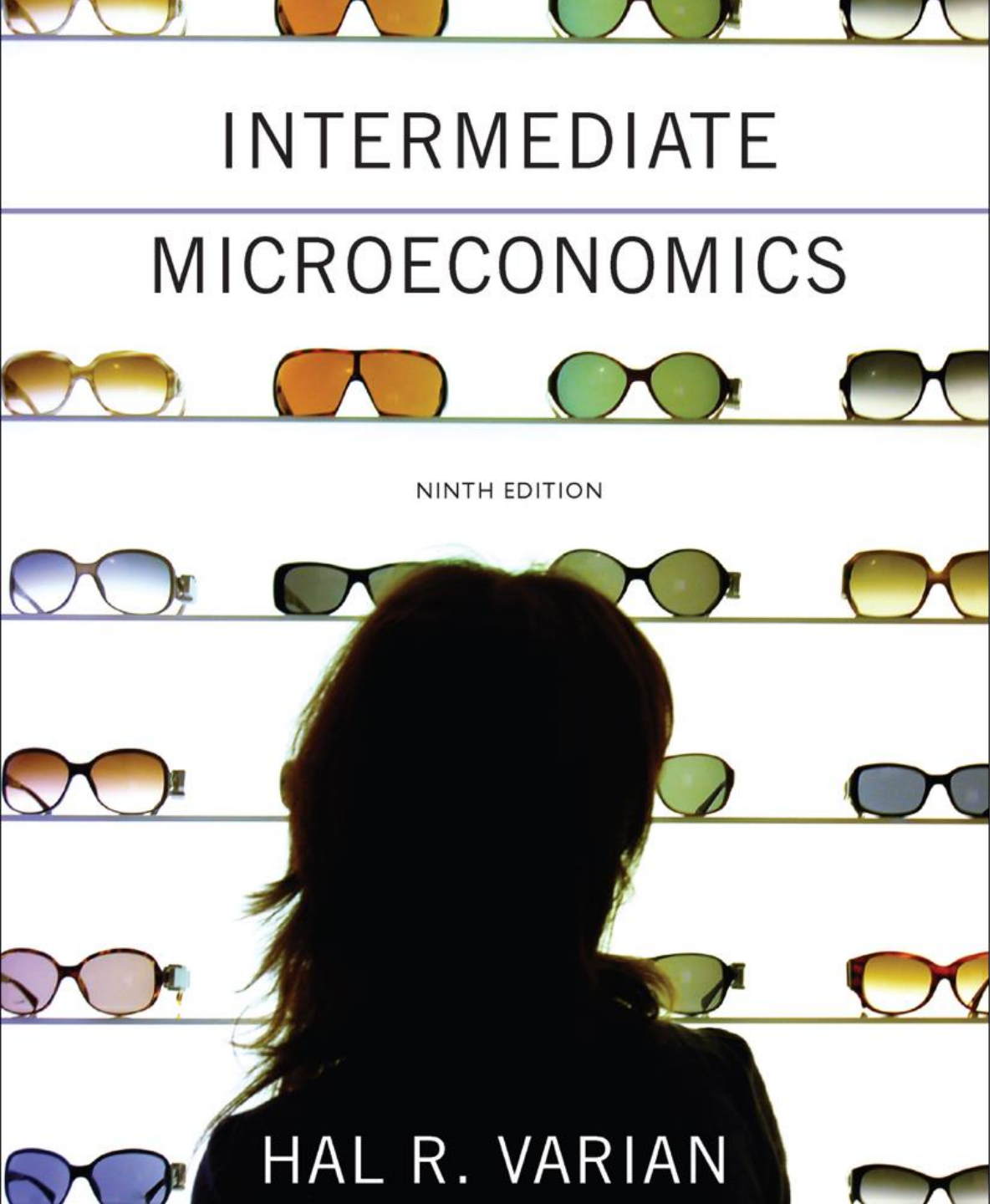


CHAPTER 26

Monopoly Behavior

How should a Monopoly price?

So far a monopoly has been thought of as a firm which has to sell its product at the same price to every customer. This is **uniform pricing**.

Can **price discrimination** earn a monopoly higher profits?

Types of Price Discrimination

First-degree: Each output unit is sold at a different price. Hence, prices may differ across **buyers** and **quantity**.

Second-degree: The price paid by a buyer can vary with **quantity,** but all **buyers** face the same price schedule, for example, bulk-buying discounts.

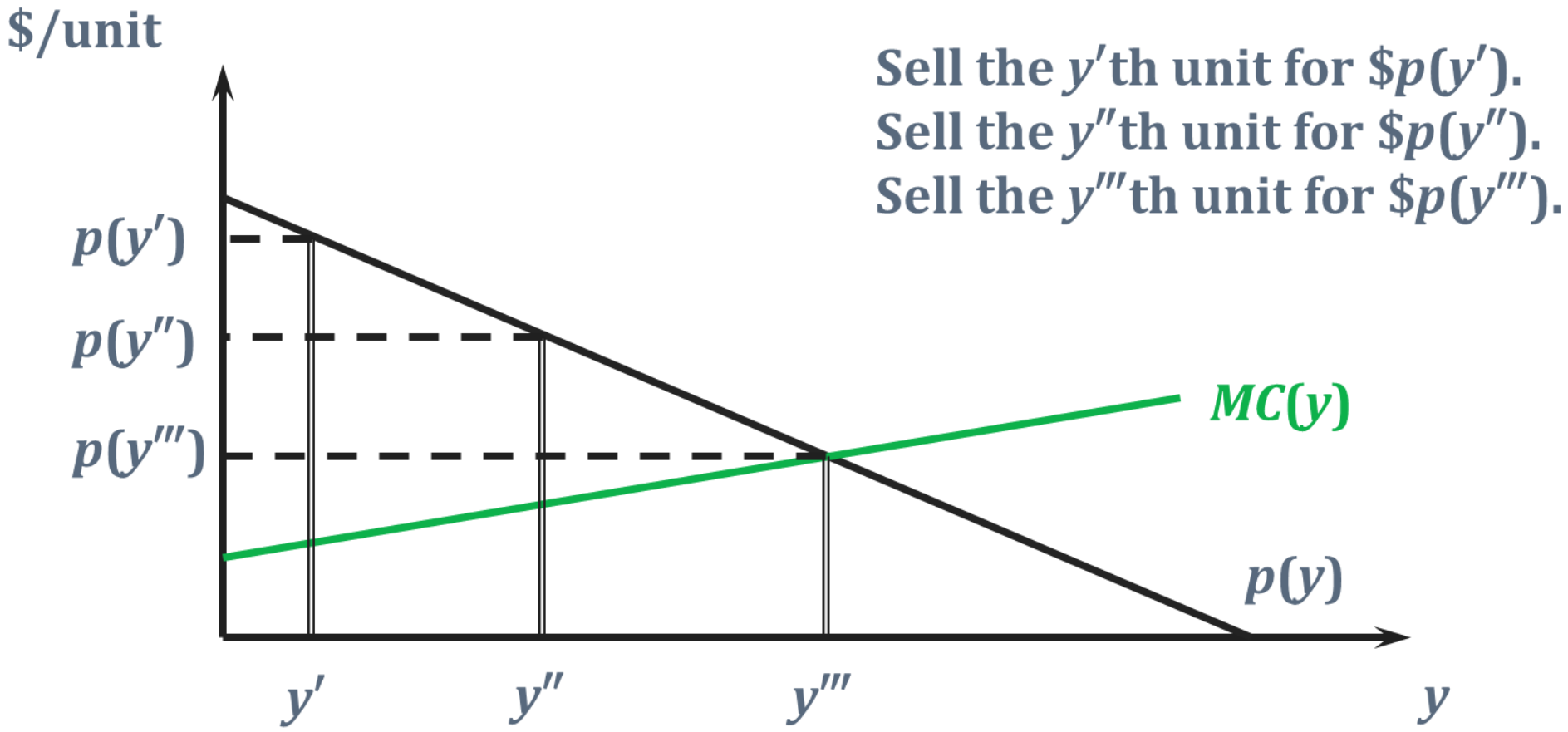
Third-degree: Prices paid by buyers in a given group are the same for all **quantities**, but prices may differ across **buyer** groups, for example, senior citizen and student discounts.

First-Degree Price Discrimination

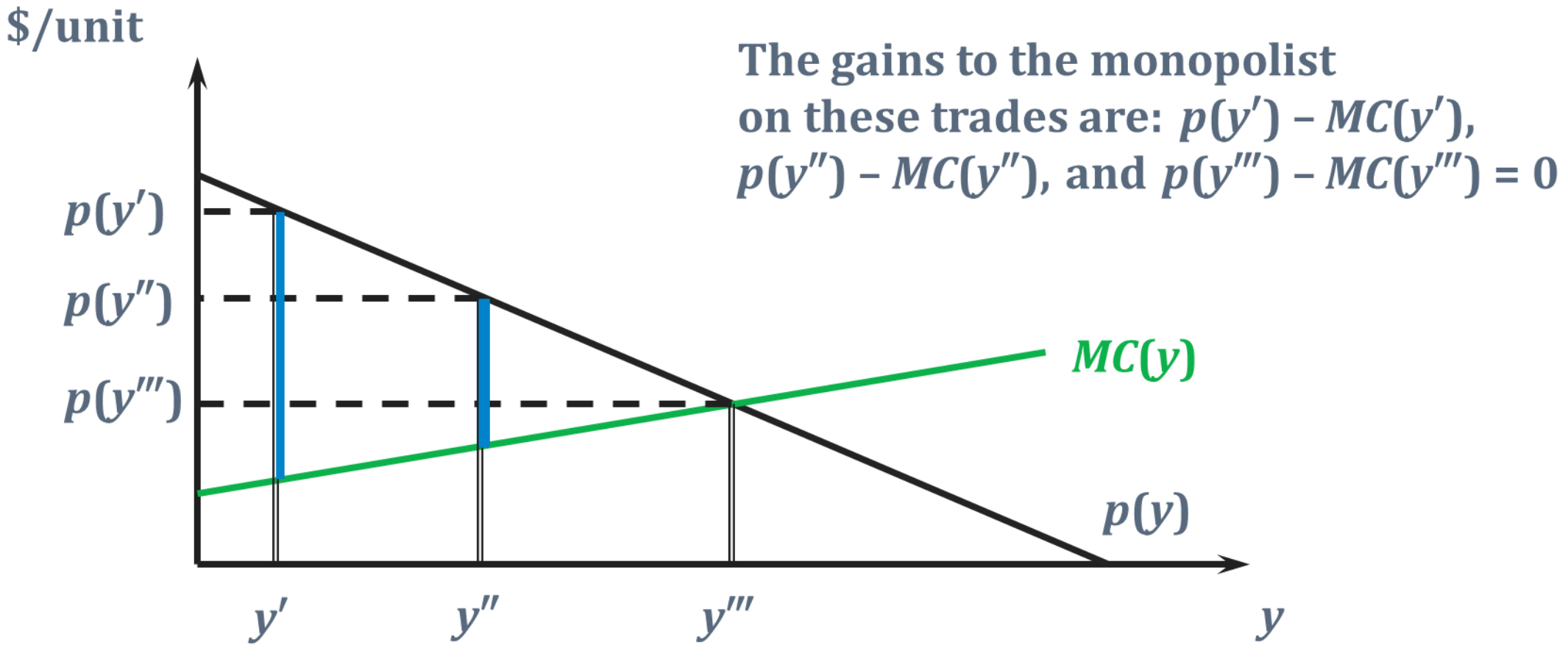
Each output unit is sold at a different price, and prices may differ across buyers.

Consider that the monopolist can discover the buyer with the highest willingness to pay of its product, the buyer with the next highest willingness to pay, and so on.

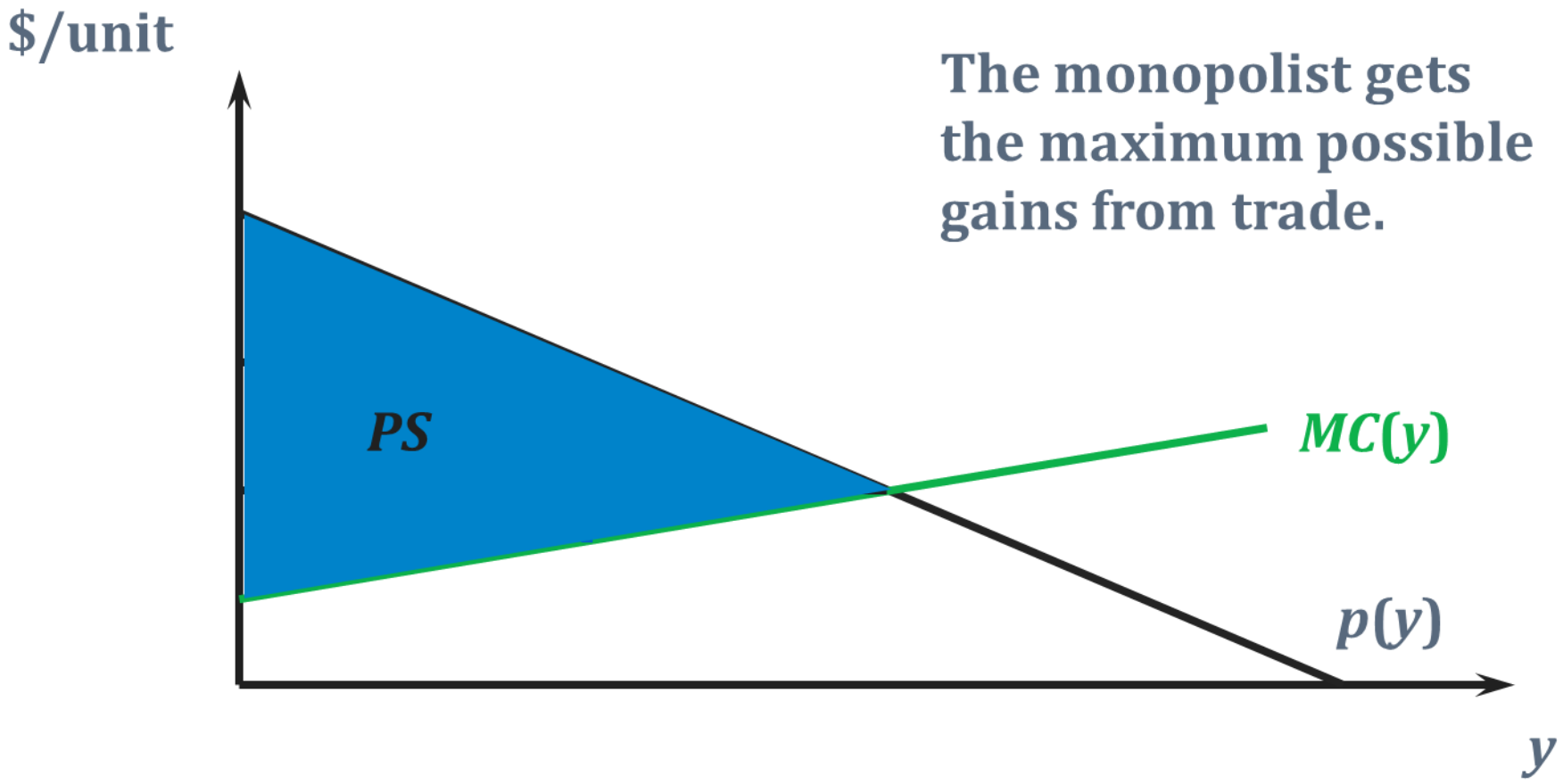
First-Degree Price Discrimination



First-Degree Price Discrimination



First-Degree Price Discrimination



First-Degree Price Discrimination

First-degree price discrimination gives a monopolist all the possible gains to trade, leaves the buyers with zero surplus, and supplies the pareto efficient amount of output.

Recall that a market is **pareto efficient** if it achieves the maximum possible total gains to trade.

A **monopoly** that can discriminate prices to the first-degree and **perfect competition** are **both pareto efficient**. However, in the first case all surplus goes to the firm, and in the second case all surplus goes to the consumer.

Third-Degree Price Discrimination

Third-degree price discrimination is that prices may differ across buyer groups, for example, senior citizen and student discounts.

A monopolist has market power (i.e., downwards sloping demand) and so it can manipulate the price by altering the quantity supplied to that market.

So, the question “What discriminatory price will the monopolist set for each group?” is similar to asking the question “How many units of the product will the monopolist supply to each group?”

Third-Degree Price Discrimination

Two markets (i.e., buyer groups), 1 and 2.

y_1 is the quantity supplied to market 1.
Market 1's inverse demand function is $p_1(y_1)$.

y_2 is the quantity supplied to market 2.
Market 2's inverse demand function is $p_2(y_2)$.

Third-Degree Price Discrimination

For given supply levels y_1 and y_2 the firm's profit is

$$\pi(y_1, y_2) = p_1(y_1)y_1 + p_2(y_2)y_2 - c(y_1 + y_2).$$

What values of y_1 and y_2 maximize profit?

Third-Degree Price Discrimination

$$\pi(y_1, y_2) = p_1(y_1)y_1 + p_2(y_2)y_2 - c(y_1 + y_2)$$

The profit-maximization conditions are:

$$\frac{\partial \pi}{\partial y_1} = \frac{\partial}{\partial y_1}(p_1(y_1)y_1) - \frac{\partial c(y_1 + y_2)}{\partial (y_1 + y_2)} \cdot \frac{\partial (y_1 + y_2)}{\partial y_1} = 0$$

$$\frac{\partial \pi}{\partial y_2} = \frac{\partial}{\partial y_2}(p_2(y_2)y_2) - \frac{\partial c(y_1 + y_2)}{\partial (y_1 + y_2)} \cdot \frac{\partial (y_1 + y_2)}{\partial y_2} = 0$$

Third-Degree Price Discrimination

$$\frac{\partial(y_1 + y_2)}{\partial y_1} = 1 \text{ and } \frac{\partial(y_1 + y_2)}{\partial 2} = 1.$$

So, the profit-maximization conditions are:

$$\frac{\partial}{\partial y_1}(p_1(y_1)y_1) = \frac{\partial c(y_1 + y_2)}{\partial(y_1 + y_2)} \rightarrow MR(y_1) = MC(y_1 + y_2)$$

$$\frac{\partial}{\partial y_2}(p_2(y_2)y_2) = \frac{\partial c(y_1 + y_2)}{\partial(y_1 + y_2)} \rightarrow MR(y_2) = MC(y_1 + y_2)$$

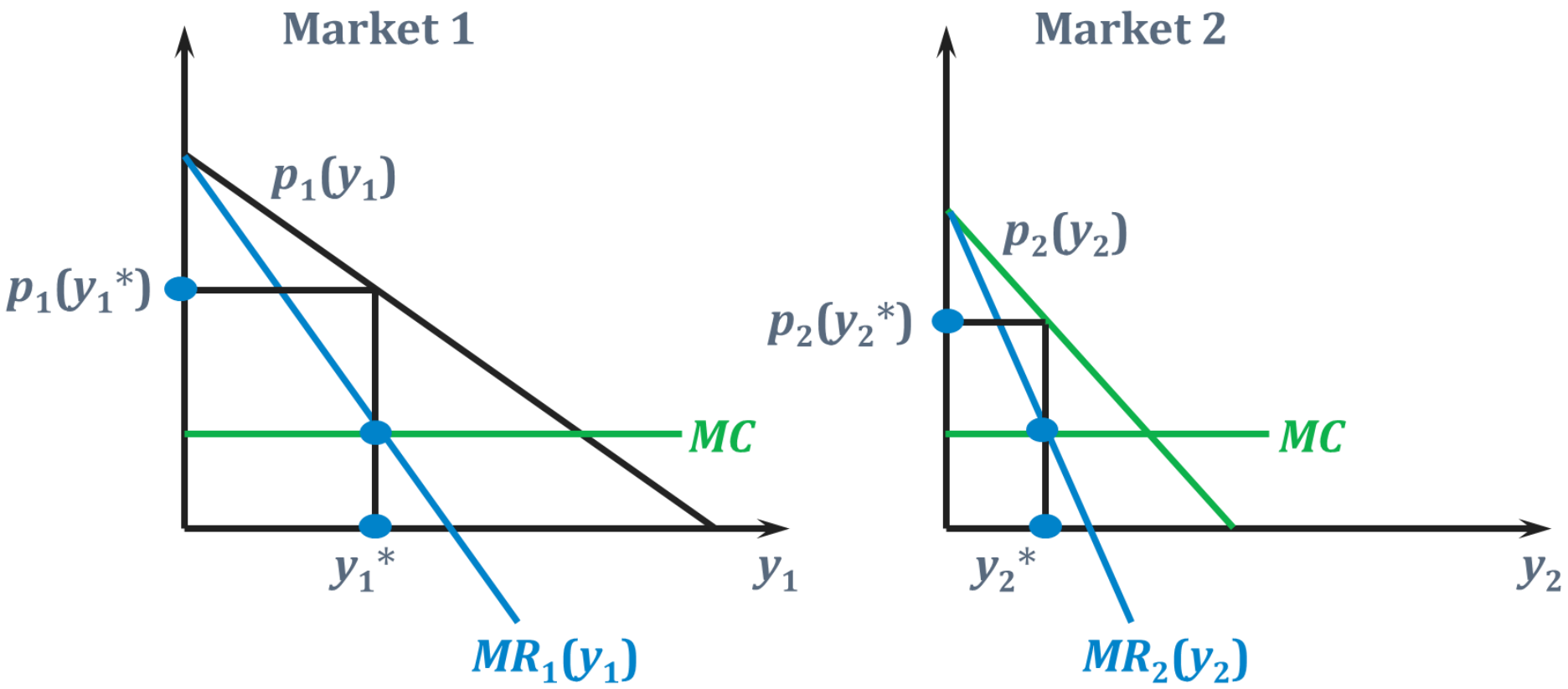
Third-Degree Price Discrimination

Therefore, $\frac{\partial}{\partial y_1}(p_1(y_1)y_1) = \frac{\partial}{\partial y_2}(p_2(y_2)y_2)$.

Or, more simply, $MR_1(y_1) = MR_2(y_2)$ when maximizing profits.

This should be intuitive. MC is the same in both markets. Hence, if for instance $MR_1 > MC > MR_2$, then firm should produce more in market 1 and less in market 2 until $MR_1 = MC = MR_2$.

Third-Degree Price Discrimination



$MR_1(y_1^*) = MR_2(y_2^*) = MC$ and $p_1(y_1^*) \neq p_2(y_2^*)$.

Two-Part Tariffs

A **two-part tariff** is a lump-sum fee, p_1, plus a price p_2 for each unit of product purchased.

For instance, in case of an amusement park, the lump-sum fee p_1 is the price to enter the park and the price p_2 is the fee for each ride.

Thus, the cost of buying x units of product is $p_1 + p_2 x$

Two-Part Tariffs

Should a monopolist prefer a two-part tariff to uniform pricing, or to any of the price-discrimination schemes discussed so far?

If so, how should the monopolist design its two-part tariff?

Two-Part Tariffs

$p = p_1 + p_2 x$

What is the largest that p_1 can be?

- p_1 is the "market entrance fee", so the largest it can be is the surplus the buyer gains from entering the market.

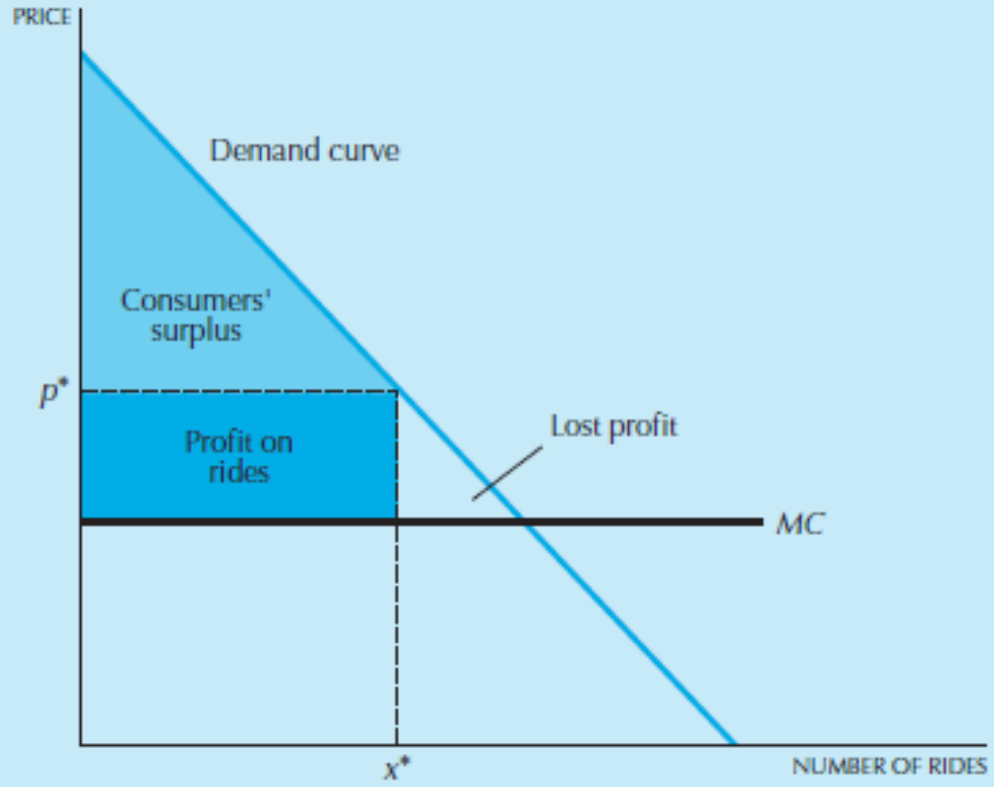
Set $p_1 = CS$ and now ask what should be p_2?

- p_2 should be set equal to the marginal cost $(p_2 = MC)$

Two-Part Tariffs

If $p_2 = MC$ and $p_1 = CS$, the monopolist has no lost profit and the market is pareto efficient.

This seems close to reality: high entry price (p_1) to amusement park but the rides are free ($p_2 = 0$).



Disneyland Dilemma. If the owners of the park set a price of p^*, then x^* rides will be demanded. The consumers' surplus measures the price that they can charge for admission to the park. The total profits of the firm are maximized when the owners set price equal to marginal cost.

Monopolistic Competition: Differentiating Products

In many markets the goods are close, but not perfect, substitutes. Examples of this are the markets for T-shirts, cars, takeout, etc. In other words, this is a market with **product differentiation**.

Each individual supplier, therefore, has some slight "monopoly power."

These markets are referred to as **monopolistic competition**. It is **not perfect competition**, since firms have some market power (demand curve is not horizontal). It is also **not a monopoly**, since there is competition via the presence of close substitutes and there is free entry and exit.

What does an equilibrium look like for such a market?

Monopolistic Competition

Profit maximization $\Rightarrow MR = MC$

→Like a monopolist

Imperfect substitution between goods $\Rightarrow$ slight downwards sloping demand

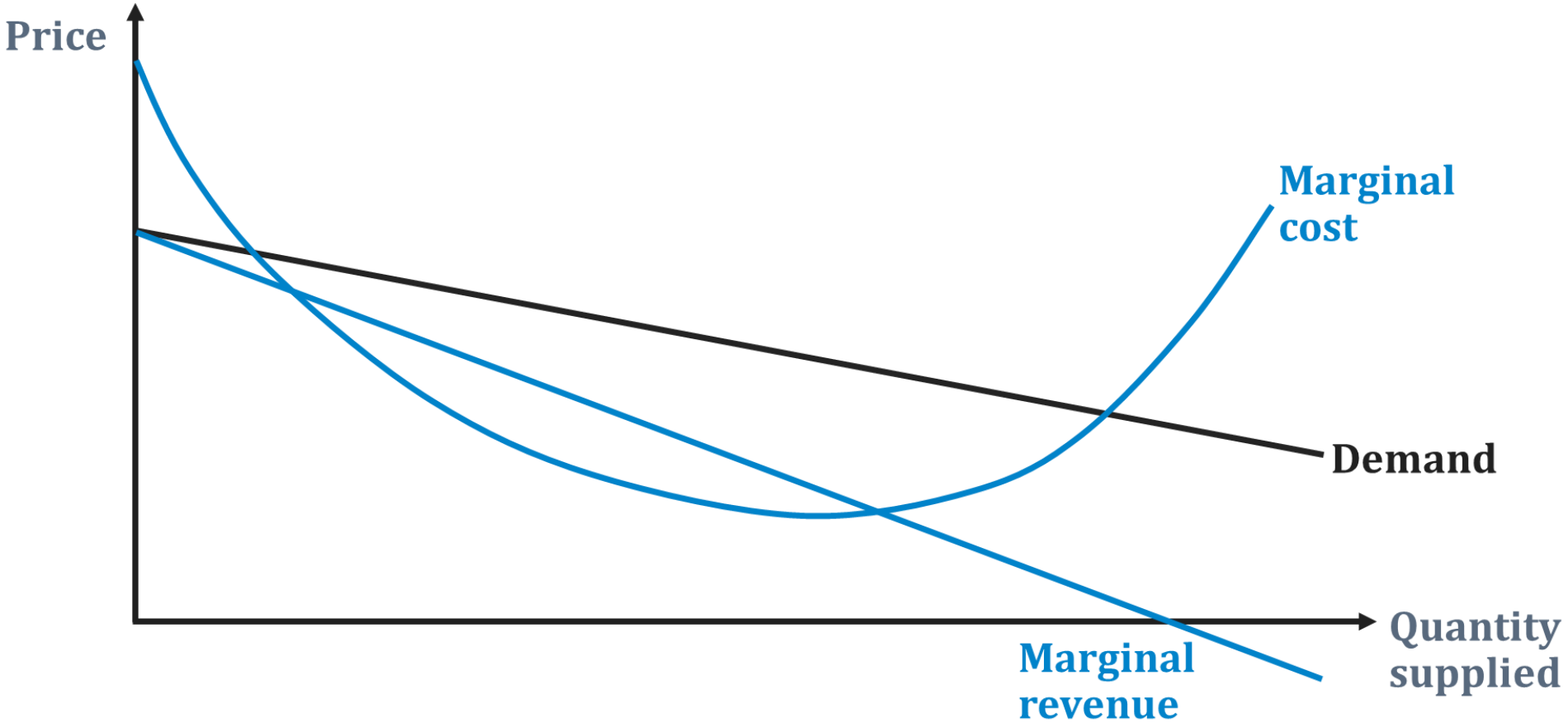
→Like a monopolist

Free entry in the LR $\Rightarrow$ zero profits in the LR

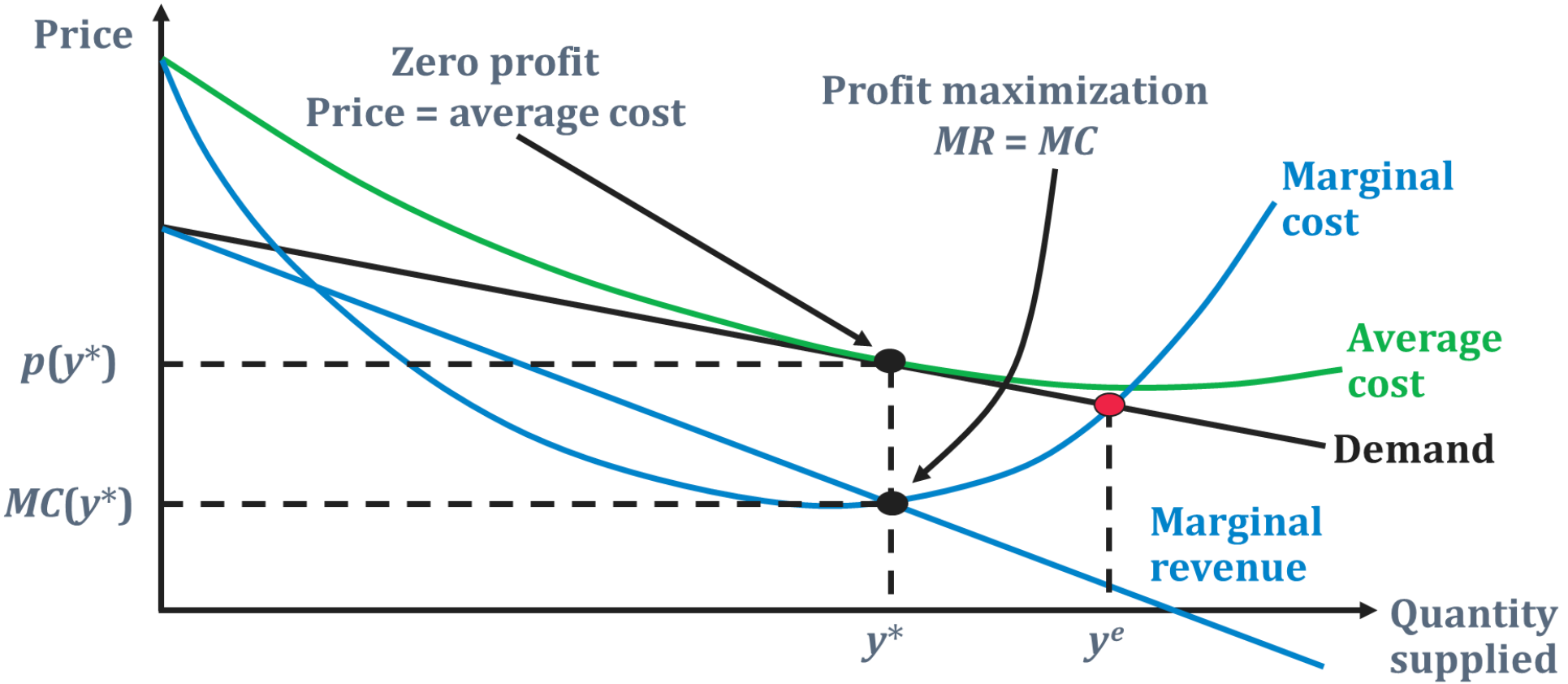
→Like a perfect competitor

If profits are positive (in the short run), then firms will enter $\Rightarrow$ demand curve shifts inwards and gets flatter until profits are zero (in the long run).

Monopolistic Competition



Monopolistic Competition: Long Run



Monopolistic Competition

Are **monopolistically competitive** markets efficient? No.

First, the equilibrium price is above MC, $p(y^*) > MC(y^*)$.

Second, firm supplies less than the efficient quantity, $y^* < y^e$.