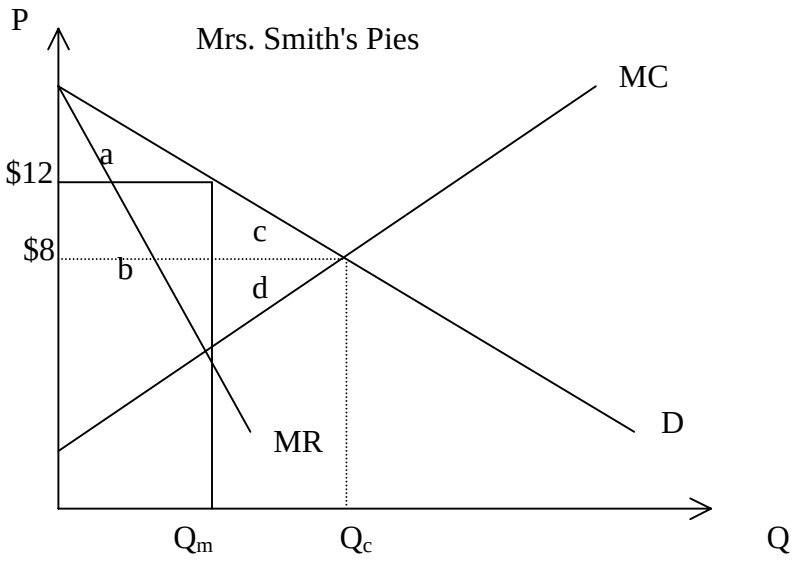
Monopoly Pricing

The analysis of pricing in Chapter 11 assumes the monopolist charges a single price to all customers. In this chapter we will see that, unlike a competitive firm, a monopolist can benefit by charging different prices for identical items.

Price Discrimination

Consider the diagram for a monopolist in the pie market.



Mrs. Smith faces a downward sloping demand curve, so she acts as a monopolist. She produces the quantity Qm where MC = MR and charges $12 per pie.

Mrs. Smith could sell additional pies if she charged any price less than $12. Some customers might approach Mrs. Smith and offer to buy additional pies at the competitive price of $8. Since this price exceeds Mrs. Smith's MC, both she and her customers would benefit from such an agreement. Both the producer's and consumer's surplus (PS and CS) would be increased. Recall that CS is measured as the area below the demand curve and above the price and PS is measured as the area above the MC curve and below the price. If she produced the additional pies (Qc - Qm) Mrs. Smith gains area d and her customers gain area c.

Although the price of $8 for the additional pies (Qc - Qm) would benefit everyone, it may not occur. Mrs. Smith will sell the extra pies for $8 only if her customers continue to buy Qm pies at the higher price of $12. Ideally, Mrs. Smith would like to sell some pies for $12 and other identical pies for $8. However, she fears that her customers will reject this scheme and pay only $8 for each pie so she charges the price of $12 and just produces Qm pies.

Mrs. Smith could try to implement the pricing scheme by allowing each customer to purchase 2 pies for $12 each and the third pie for just $8. This enables her to sell each customer a third pie

for $8 without under cutting her sales of $12 pies. Such a pricing scheme is called second-degree price discrimination. It refers to a schedule of prices that fall as the quantity purchased by a particular customer increases.

But this pricing is also problematic because some of her customers may have been willing to pay $12 for the third pie. Furthermore, some customers may buy a third pie for $8 and resale it for $10 to a person who would have bought it from Mrs. Smith for $12.

Charging different prices for identical items is called price discrimination. Any monopolist is tempted to price discriminate because they produce where P > MC. So a monopolist can always expand sales and receive a P that is above MC. A competitive firm is not tempted to price discriminate because it can sell as much as it likes at the prevailing market price, so there is no incentive to reduce prices.

There are three requirements for successful price discrimination:
(1) The producer must face a downward sloping demand curve so it has some degree of monopoly power.

(2) The producer must have some means of approximating the maximum amount that buyers are willing to pay for each unit.

(3) The producer must prevent resale of the product because it undermines the producer's ability to sell at higher prices.

> Goods or services that are immediately consumed (e.g., movies, electricity, doctors' services, airplane tickets, etc.) are not as susceptible to resale. By contrast, manufactured items (like watches, stereos, or computers) can be purchased by one person and later sold to someone else. Therefore, price discrimination is less common for manufactured goods than for services.
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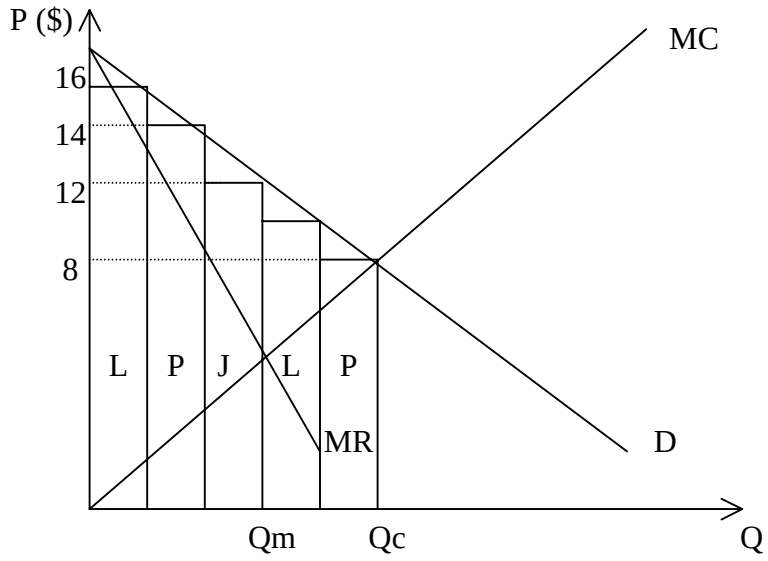
> Question: What are grey markets?

First-Degree Price Discrimination

Mrs. Smith can expand her profits even further if she can charge each customer a price that equals the customer's MU. This is shown in the diagram below.



The rectangles reflect the MU that each customer places on Mrs. Smith's pies. Each rectangle is labeled with the customer's initials (L = Leah, P = Pedro, and J = Joe). Leah is willing to pay $16 for her first pie and $10 for her second pie. Pedro is willing to pay $14 for his first pie and $8 for his second pie, and Joe is willing to pay $12 for his first pie. If Mrs. Smith knows each customers valuation (or MU) of the pies, she can set P = MU for each customer.

This pricing scheme allows Mrs. Smith to capture all of the CS for herself. Each customer pays the maximum amount that he is willing to pay for each pie, so he receives no surplus. Mrs. Smith gains the entire area below the demand curve and above the MC curve. She will sell pies as long as she can collect prices above MC. There is no deadweight loss under this scheme because Mrs. Smith produces the output level Qc where MU = MC.

This scheme is called first-degree or perfect price discrimination, to distinguish it from second-degree price discrimination where each customer is offered the same set of prices, although the price may depend on the quantity purchased. Examples of second-degree price discrimination include frequent flyer programs, utilities, Ralphs Club, or McDonald's value meal. In first-degree price discrimination, the prices are individually tailored so that each customer is charged the highest price he is willing to pay for each item.

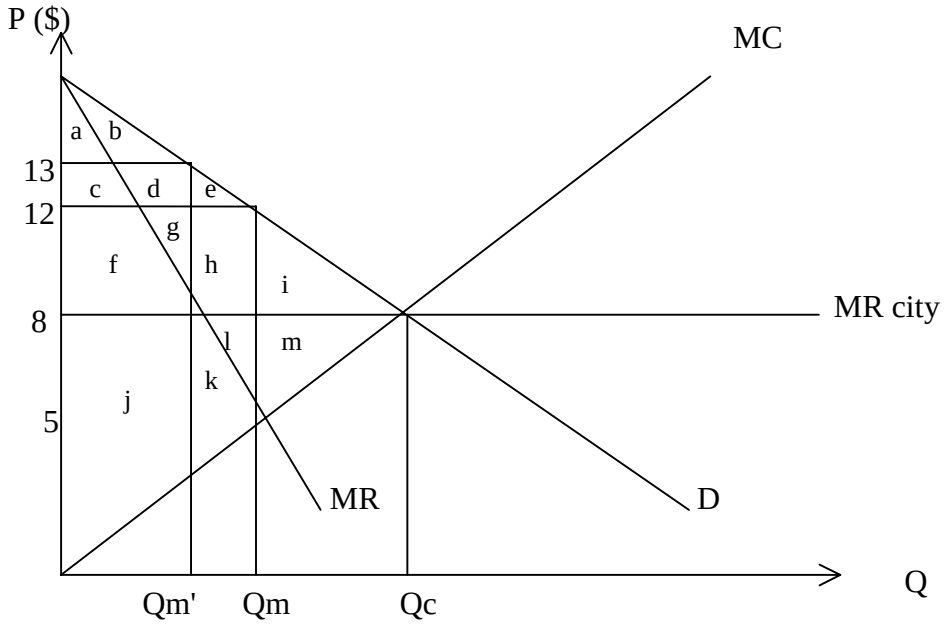
Both forms of price discrimination lead to an increase in output and an increase in welfare (i.e., CS + PS). Second-degree price discrimination benefits the producer and the consumers, but first-degree price discrimination only benefits the producer, since the producer captures the entire CS.

First-degree price discrimination is rare because it is hard to accomplish. It is difficult for firms to assess the maximum amount that each customer is willing to pay. If the customer is asked directly, she has an incentive to understate her MU in order to receive a lower price. Attempts at perfect price discrimination include doctors who have sliding scales for services and car dealerships.

Third-Degree Price Discrimination

The most common form of price discrimination is called third-degree price discrimination. This occurs when a seller faces two (or more) identifiably different groups of buyers that have different (downward sloping) demand curves. Such a seller can raise profits by setting different prices for the two groups. Examples include drugstores that offer discounts to seniors, or airlines that offer discounts to passengers who are willing to stay over on Saturday night.

Mrs. Smith has found a second market for her pies. A grocery store in a large city 300 miles away is willing to buy as many pies as Mrs. Smith wants to sell at $8 each. Consider the diagram below.



What quantity of pies should Mrs. Smith sell to her local customers? The ordinary monopoly quantity is Qm. At this Q, her MR is $5 per pie. But she receives $8 in MR from the big city grocery store, so it pays to sell more pies in the city and fewer locally. Optimally, Mrs. Smith chooses quantities so that the MR is the same in each market. Equating the local and city MR indicates that she will sell Qm' pies for $13 apiece locally. Mrs. Smith behaves as a perfectly competitive firm in the big city market setting MR = MC because the city demand (and hence MR) is horizontal. Her total production is Qc, and Qc-Qm' pies are sold in the city for $8 each.

If Mrs. Smith sold only in the local market the deadweight (DWL) loss is i + m. When she can sell in both markets and price discriminate, the deadweight loss is e + h + i.

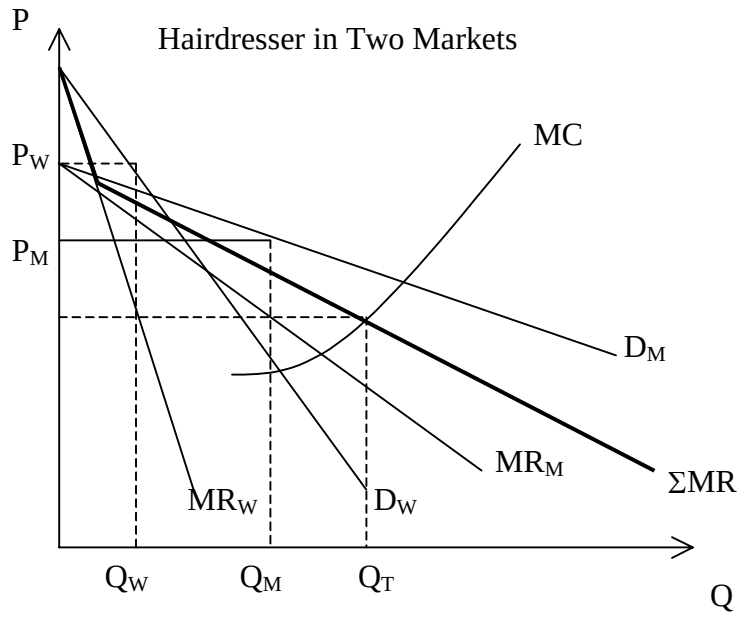
Question: Can you explain why area m is gained and e + h is lost with price discrimination?

The table below indicates the welfare changes resulting from different firm behavior.

	Competition	Ordinary Monopoly	Price Discriminating Monopoly
CS	abcdefghi	abcde	ab
PS	jklm	fghkjl	cdfgj + klm
DWL	------	im	ehi

The preceding example assumed the firm was a competitor in one market and a monopoly in another. Sometimes a producer is a monopoly in two markets. The producer's behavior is essentially the same in this later case.

Consider a hairdresser named Cathy who cuts men and women's hair. How should she decide how many haircuts to sell to each group and what prices to charge? The diagram below shows the relevant information for men (M) and women (W) customers.



The diagram shows a graphic method for determining how many haircuts Cathy will sell to each group. The MR_M and MR_W curves are the MR curves that she faces in the men and women's markets. The ΣMR curve is obtained by summing MR_M and MR_W horizontally.

The most profitable output occurs where the sum of the separate MR curves (i.e., ΣMR) intersects MC at Q_T. This ensures that MR is equalized across both markets and also equal to MC. She sells Q_W haircuts to women at a price of P_W and Q_M haircuts to men at a price of P_M. Not surprisingly, Cathy charges men (the group with the more elastic demand) a lower price than she charges women (the group with the less elastic demand).

The monopolist will always charge the group with the more elastic demand a lower price. Roughly, this means that the monopolist will charge less in the market where she is closer to being a competitor.

Movie theaters that offer discounts to seniors and students are engaging in third-degree price discrimination. So are airlines that offer cheaper fares to those passengers who stay over on Saturday night. In each case, a lower price is offered to customers who are more sensitive to price. A possible reason for this is that seniors and students have below-average incomes or low values of time. Furthermore, most business travelers are unwilling to stay over on a Saturday night and their firm pays for the ticket, which reduces the elasticity of demand.

Price Discrimination and Welfare

When a monopolist moves from setting a single price to practicing price discrimination, its total output may go up or down. Social welfare (i.e., sum of PS and CS) may go up or down. In general, *if* total output falls, *then* social welfare must also fall.

Examples and Counterexamples of Price Discrimination

Discount coupons for supermarkets are a means of offering lower prices to customers who are more price sensitive. Shoppers who find it worth their time to clip coupons are those with a low value of time (e.g., their wages may be low) who probably have a greater propensity for comparison-shopping. A supermarket's best policy is to charge lower prices to customers who would otherwise shop elsewhere. It is important to realize that there would be no point to offering coupons if everyone redeemed them. In this case, the store could just lower its prices to all customers and have the same effect. Similarly, there would be no point in offering coupons if some random group of customers redeemed them. The coupons are targeted to exactly those customers who are most sensitive to price.

Manufacturers' rebates (e.g., mail in a coupon after purchase to receive $10 back) work in the same way. They are redeemed by customers who are willing to devote extra time and energy to recovering a few dollars. These are the same individuals who are willing to spend more time on comparison-shopping.

When you get "free delivery" you are being charged less for a pizza than someone who picks it up at the counter. By phoning the order in you save time and gasoline. People who order by phone have a more elastic demand because they can simply hang up the phone and order pizza elsewhere. Whenever a producer offers free extras that only some customers take, you should ask how the extras have been designed to reach the more elastic consumers.

Many hotels offer rooms at different prices. If you call in ahead you may get a room for $60, but if you arrive at the hotel at 11:00 p.m. looking sleepy you may pay $75 for the same room because the "$60 rooms are all filled up."

Many business practices have the appearance of price discrimination when they are not. Price discrimination occurs when the *same* product is sold at different prices. Often, a careful examination will reveal that two apparently identical products are actually very different.

Many restaurants offer a lower price at the salad bar to those who order an entrée. This is not price discrimination because people who order entrees tend to take less food at the salad bar. The lower price of the salad bar to those with entrees reflects the lower cost of the restaurant.

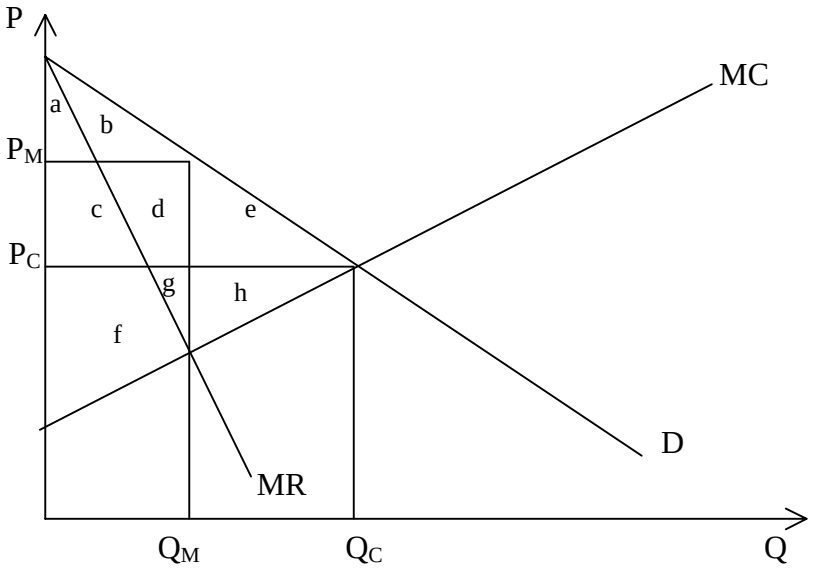
Ice cream shops normally charge less for a second scoop than for a first. Is this second-degree price discrimination? Neither the preparation of the cone, the opening of the freezer, nor the ringing of the cash register has to be repeated for the second scoop. These factors make the second scoop cheaper for the ice cream shop.

Two-Part Tariffs --a form of second-degree price discrimination

Hewlett-Packard (HP) is the only maker of HP printers and HP toner cartridges. Should HP charge a low price for the printers to increase the demand for toner cartridges? Or should it charge a low price for toner to increase the demand for high-priced printers?

Some monopolies get to charge their customers twice. There is an initial fee (for the HP printer) and then ongoing charges for the purchase of goods or services (like toner cartridges). The initial fee buys you the rights to make future purchases. When a firm charges a fee for the right to buy subsequent products, it has set a "two-part tariff." Generally, the word tariff refers to a tax on imported goods, but the phrase "two-part tariffs" is an exception --tariff simply means "price."

Consider the diagram below to assess the optimal strategy for a two-part tariff monopolist.



The quantity on the horizontal axis is the quantity that consumers purchase after the entry fee. In the case of HP, it is the number of toner cartridges. What happens if the firm charges the monopoly price Pm? The firm earns cdfg in producer surplus (PS). So how much should the monopolist charge consumers for the right to buy those products? They will charge the maximum amount that the consumers are willing to pay --shown by area ab. Thus, the firm captures the entire CS (i.e., area ab) in entry fees and cdfg on subsequent sales.

However, the firm could do better (i.e., gain area eh) by charging the competitive price (Pc) on its sales. PS falls to fgh but the entry fee is now abcde (i.e., the entire CS). Here the firm charges a lower per unit sales price but a higher entry fee. The firm does best by charging the competitive price (where MU = MC) because it can collect all of the social gain. Recall that the social gain (PS + CS) is largest under competitive pricing.

Understand that the two-part tariff monopolist charges an admission fee that is equal to the entire CS. So if area abcde = $1,000 and the firm has 100 identical customers, then each of the 100 customers pays a $10 entry fee.

Consider what happens if the customers are not identical. Say area abcde = $1,000 but 1 customer receives $901 of CS, while the 99 other customers receive $1 in CS. If the monopolist charges the entry fee of $10, it will drive 99 customers away.

So what should the firm do if its customers are fairly different? It should try to price discriminate. By charging a low entry fee and a high price for the product the monopolist essentially charges lower prices to the lightest users, and there is a good chance that the lightest users are the most price sensitive. This is exactly the strategy that HP has followed. It charges very little for its laser printers and makes all of its profits on the subsequent sales of toner cartridges. The real goal is to charge the most to those who are willing to pay the most; and

those who are willing to pay the most are likely to be the ones who use the printers most often (e.g., businesses).

A two-part tariff monopolist with *identical* customers will want to capture as much CS as possible by setting a low competitive price for the product and a high entry fee. Alternatively, a two-part tariff monopolist with *very different* customers will want to price discriminate by charging a low entry fee and a high price for the product.