

Profit-maximization for a firm that's not perfectly competitive.

Recall:

3 types of industries that are not perfectly competitive:

Monopolistic competition

Oligopoly

Monopoly

In each of the three types of industries above, a firm must reduce its price in order to sell more product.

The firm's demand equation tells us how much the price must fall as the quantity of product sold goes up.

Important note: in the next example we will assume that the firm must charge the same price per unit of output to all sellers for all units sold, due to a government law.

Example: A firm has demand equation

$$Q = 10 - P$$

and total cost equation

$$\$C = 5Q.$$

It must charge the same price per unit of output, P , to all buyers. Calculate the firm's profit-maximizing price and output. (Assume the firm must sell an integer amount of product.)

First: Calculate the firm's total revenue using information from the demand equation $Q = 10 - P$

Q	P	Total revenue
0	\$10	\$0
1	\$9	\$9
2	\$8	\$16
3	\$7	\$21
4	\$6	\$24
5	\$5	\$25
6	\$4	\$24
7	\$3	\$21
8	\$2	\$16
9	\$1	\$9

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Second: Calculate the firm's total cost using the cost function $\$C = 5Q$

Q	Total cost
0	\$0
1	\$5
2	\$10
3	\$15
4	\$20
5	\$25
6	\$30
7	\$35
8	\$40
9	\$45

$$\$c = 5Q = 5(7) = 35$$

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Third: Put the quantity, price, total revenue and total cost information in the same table, calculate total profits

Q	P	Total revenue	Total Cost	Total Profits
0	10	\$0	\$0	\$0
1	9	\$9	\$5	\$4
2	8	\$16	\$10	\$6
3	7	\$21	\$15	\$6
4	6	\$24	\$20	\$4
5	5	\$25	\$25	\$0
6	4	\$24	\$30	\$-6
7	3	\$21	\$35	\$-14
8	2	\$16	\$40	\$-24
9	1	\$9	\$45	\$-36

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The firm will maximize profits at \$6 if it chooses either of these options:

- Produce a quantity of 2 and charge \$8 per unit sold
- Produce a quantity of 3 and charge \$7 per unit sold

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