

# Inflexible Production

Notes on solution

High skilled workers with specialized capital

Each worker needs exactly one unit of capital and can produce up to 10 units of output. Prices of inputs are:

Pls            200 price of labor  
 Pks            70 price of capital

Demand for output:  $P = A - B \cdot Q$  where A and B are:

A            50  
 B            1

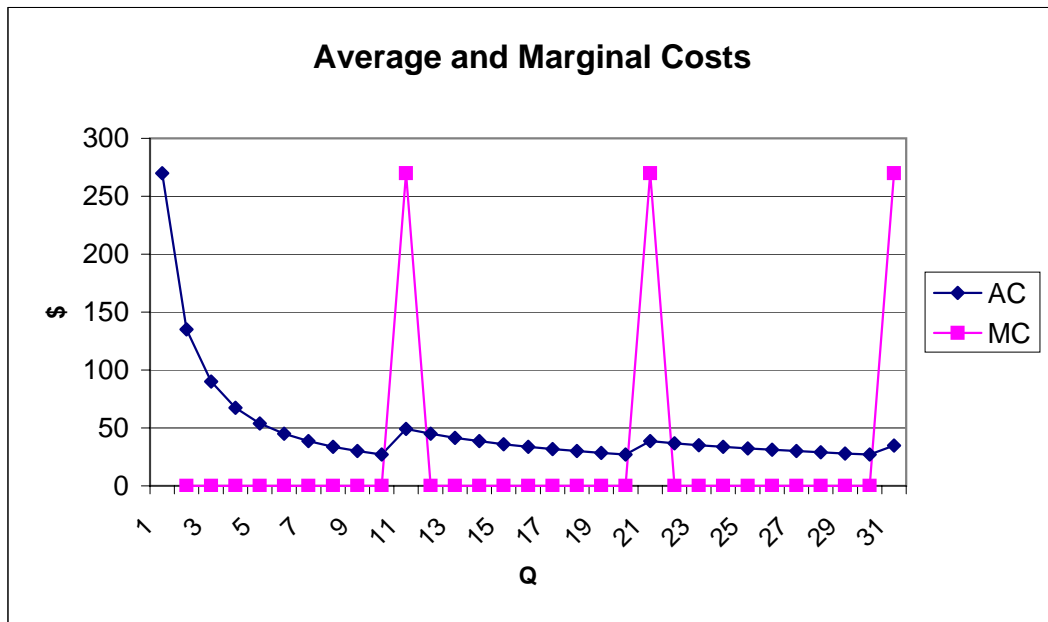
Q	K	L	TC	AC	MC	P	TR	AR	MR	MR - MC	AR-AC	Profit
1	1	1	270	270.00		49	49	49			-221.00	-221
2	1	1	270	135.00	0	48	96	48	47	47.00	-87.00	-174
3	1	1	270	90.00	0	47	141	47	45	45.00	-43.00	-129
4	1	1	270	67.50	0	46	184	46	43	43.00	-21.50	-86
5	1	1	270	54.00	0	45	225	45	41	41.00	-9.00	-45
6	1	1	270	45.00	0	44	264	44	39	39.00	-1.00	-6
7	1	1	270	38.57	0	43	301	43	37	37.00	4.43	31
8	1	1	270	33.75	0	42	336	42	35	35.00	8.25	66
9	1	1	270	30.00	0	41	369	41	33	33.00	11.00	99
10	1	1	270	27.00	0	40	400	40	31	31.00	13.00	130
11	2	2	540	49.09	270	39	429	39	29	-241.00	-10.09	-111
12	2	2	540	45.00	0	38	456	38	27	27.00	-7.00	-84
13	2	2	540	41.54	0	37	481	37	25	25.00	-4.54	-59
14	2	2	540	38.57	0	36	504	36	23	23.00	-2.57	-36
15	2	2	540	36.00	0	35	525	35	21	21.00	-1.00	-15
16	2	2	540	33.75	0	34	544	34	19	19.00	0.25	4
17	2	2	540	31.76	0	33	561	33	17	17.00	1.24	21
18	2	2	540	30.00	0	32	576	32	15	15.00	2.00	36
19	2	2	540	28.42	0	31	589	31	13	13.00	2.58	49
20	2	2	540	27.00	0	30	600	30	11	11.00	3.00	60
21	3	3	810	38.57	270	29	609	29	9	-261.00	-9.57	-201
22	3	3	810	36.82	0	28	616	28	7	7.00	-8.82	-194
23	3	3	810	35.22	0	27	621	27	5	5.00	-8.22	-189
24	3	3	810	33.75	0	26	624	26	3	3.00	-7.75	-186
25	3	3	810	32.40	0	25	625	25	1	1.00	-7.40	-185
26	3	3	810	31.15	0	24	624	24	-1	-1.00	-7.15	-186
27	3	3	810	30.00	0	23	621	23	-3	-3.00	-7.00	-189
28	3	3	810	28.93	0	22	616	22	-5	-5.00	-6.93	-194
29	3	3	810	27.93	0	21	609	21	-7	-7.00	-6.93	-201
30	3	3	810	27.00	0	20	600	20	-9	-9.00	-7.00	-210
31	4	4	1080	34.84	270	19	589	19	-11	-281.00	-15.84	-491

To maximize profits: hire 1 employee and use 1 units of capital. Produce 10 units of output and sell each unit for \$40. Profits will be \$130 per day.

To maximize output: hire 2 employees and use 2 units of capital. Produce 20 units of output and sell each for any price between \$27 (equal to AC; earn no profits but have excess demand) and \$30 (equal to W2P; have no excess demand but earn some profits).

More explanation on page 2 ...

Note that this example is unusual: the solution for profit maximization does not have MR equal to MC and the solution for output maximization does not have AR=AC. That's a consequence of the sharp jumps in the production function that cause the MC and AC curves to have spikes:



These spikes mean that the organization really has to choose between three production functions: one with  $K=1$ ,  $L=1$  that can produce 0-10 units with zero MC and a fixed cost of \$270 (the cost of paying for the employee and one unit of  $K$ ); one with  $K=2$ ,  $L=2$  that can produce 0-20 units with zero MC and a fixed cost of \$540; and one with  $K=3$ ,  $L=3$  that can produce 0-30 units with zero MC and a fixed cost of \$810. The first option is best for profit maximization and the second option is best for output maximization.