

Illustrating the Effect of Diminishing Returns to Labor on Marginal Cost									
Output per Hour	Laborers	MPL	TC	FC	VC	AFC	AVC	ATC	MC
Q	L		\$	\$	\$	\$	\$	\$	\$
1	2	3	4	5	6	7	8	9	10
0	0.000		3.00	3.00	0.00				
1	1.000	1.000	3.30	3.00	0.30	3.00	0.30	3.30	0.30
2	2.667	0.600	3.80	3.00	0.80	1.50	0.40	1.90	0.50
3	5.000	0.429	4.50	3.00	1.50	1.00	0.50	1.50	0.70
4	8.000	0.333	5.40	3.00	2.40	0.75	0.60	1.35	0.90
5	11.667	0.273	6.50	3.00	3.50	0.60	0.70	1.30	1.10
6	16.000	0.231	7.80	3.00	4.80	0.50	0.80	1.30	1.30
7	21.000	0.200	9.30	3.00	6.30	0.43	0.90	1.33	1.50
8	26.667	0.176	11.00	3.00	8.00	0.38	1.00	1.38	1.70
9	33.000	0.158	12.90	3.00	9.90	0.33	1.10	1.43	1.90
10	40.000	0.143	15.00	3.00	12.00	0.30	1.20	1.50	2.10
Notes									
Col. 1. Notice output rises steadily, adding one unit each time.									
Col. 2. This column gives the number of workers hired. If its 2.667, the .667 represents 40 minutes of labor input instead of a 60 minute hour. NOTICE THAT THE NUMBER OF LABORERS HIRED PER HOUR IS RISING AND RISING FASTER THAN OUTPUT. THE EXTRA WORKERS ARE SUBJECT TO DIMINISHING RETURNS (FALLING MPL).									
Col. 3. This is the Marginal Product of Labor, the increase in output divided by the increase in laborers hired per hour. For example, in increasing output from 6 to 7 units (i.e. one unit increase in output), labor increases from 16 to 21 (i.e. 5 laborers employed for one hour). This means the MPL is 1/5 or .200. NOTICE, MPL IS DECREASING, THAT IS, DIMINISHING RETURNS ARE PRESENT. At the margin, more workers are required to produce each extra unit of output.									
Col. 4. $TC = FC + VC$.									
Col. 5. $FC = \text{fixed costs}$									
Col. 6. $VC = \text{variable costs}$. Assume labor costs .30 cents per hour.									
Col. 7. $AFC = FC/Q$									
Col. 8. $AVC = VC/Q$									
Col. 9. $ATC = TC/Q$									
Col. 10. $MC = (\text{Change in } TC / \text{Change in } Q)$. NOTICE, AS MORE AND MORE WORKERS ARE REQUIRED TO PRODUCE EACH UNIT INCREASE IN OUTPUT, THIS HAS A DIRECT EFFECT ON MARGINAL COSTS. E.g. The tenth unit requires an extra 7 workers which, at .30 cents per hour, means an extra \$2.10 for TC.									