SHORT-RUN COSTS: A NUMERICAL ILLUSTRATION

A firm is operating in the short run. Its capital is fixed. Labor is the only variable input. The going "price of labor" is $100/day and the firms fixed costs are $1,000.

1 L	2 Q	3 MP	3a AP	4 VC	5 AVC	6 FC	7 AFC	8 TC	9 ATC	10 MC
0	0	-		0	-	1000	-	1000	-	-
1	10	10	10	100	10.0	1000	100.0	1100	110.0	10.0
2	25	15	12.5	200	8.0	1000	40.0	1200	48.0	6.7
3	45	20	15	300	7.5	1000	22.2	1300	29.7	5.0
4	60	15	15	400	6.7	1000	16.7	1400	23.4	6.7
5	70	10	14	500	7.1	1000	14.3	1500	21.4	10.0
6	75	5	12.5	600	8.0	1000	13.3	1600	21.3	20.0
7	77	2	11	700	9.1	1000	13.0	1700	22.1	50.0
8	78	1	9.75	800	10.3	1000	12.8	1800	23.1	100.0
9	78	0	8.7	900	11.5	1000	12.8	1900	24.4	---

Notes:

Short run production function: Q = f (L), cols. 1 and 2
Marginal product of labor: (3) = change (2)/ change (1)

Variable costs = VC = w L = 100 x col. (1) = col. (4)
Average variable costs = VC/Q = col. (5) = col. (4)/ col. (2)

Fixed costs = $1,000 irrespective of output level
AFC = FC/Q, col. (7) = col. (6) / col. (2)

Total Costs = VC + FC; col. (8) = col. (4) + col. (6)
ATC = TC/Q = AVC + AFC; col.(9) = col.(8) /col.(2) = cols.(5)+(7)

Marginal Cost = change in cost/change in output; (10) = Δ(8)/Δ(2)
or (10) = Δ(4)/Δ(2)