

Economics 101
Spring 2000
Section 4 - Hallam
Quiz 8

1. What is the elasticity of demand (mid-point formula) for a demand curve given by $P = 500 - 2Q^D$ as quantity goes from 60 to 65?
 - a. -6
 - b. -1/6
 - c. -3.3478
 - d. -0.333
 - e. -3

2. Consider the following production function

$$y = 20x_1 + 20x_2 - 0.5x_1^2 - x_2^2$$

The price of x_1 is \$7 and the price of x_2 is \$2. You are trying to which of the following sets of points is the cost minimizing way to produce 198 units of output. Which of the following points is the minimum cost way to produce 198 units of output? (Be very careful on this problem!)

x_1	x_2	y	MPP_1	MPP_2	MRS	w_2 / w_1
11.282	2.000	198.000	8.718	16.000	-1.83532587	
9.704	3.000	198.000	10.296	14.000		
8.511	4.000		11.489	12.000		
8.000	5.000		12.000	10.000	-0.83333333	
7.000	6.000		13.000	8.000		
6.362	7.000		13.638	6.000		
6.000	8.000		14.000	4.000		
5.787	9.000	198.000	14.213	2.000		

- a. $x_1 = 8.511, x_2 = 4.000$
 - b. $x_1 = 8.000, x_2 = 5.000$
 - c. $x_1 = 7.000, x_2 = 6.000$
 - d. $x_1 = 6.362, x_2 = 7.000$
 - e. $x_1 = 6.000, x_2 = 8.000$
3. Marginal cost measures
 - a. the change in an input required to produce one more unit of output
 - b. the change in output that can be obtained from one more dollar of expenditure
 - c. the change in cost from the production of one more unit of output
 - d. the change in output that results from one more unit of an input
 - e. the level of output divided by the level of input
 4. A firm can maximize profits in the short run by producing output where
 - a. marginal revenue is significantly larger than marginal cost
 - b. $MR = MC$ and the MC curve crosses the MR curve from below
 - c. $MR = MC$ and the MC curve crosses the MR curve from above
 - d. $TR = TC$
 - e. the firm hires ISU faculty as consultants

5. Consider the following data on consumption of q_1 and q_2 . The price of q_1 is \$5.00. The price of q_2 is \$15.00. Income is \$90. MU_1 is the marginal utility of good 1 and MU_2 is the marginal utility of good 2. Which of the following combinations of goods maximizes utility.

q_2	q_1	MU_1	MU_2
0	18	0.000	∞
1	15	0.181	5.409
2	12	0.320	3.834
3	9	0.499	2.990
4	6	0.787	2.360
5	3	1.461	1.753
6	0	∞	0

- d. $q_2 = 4, q_1 = 6$
6. Marginal revenue measures
- the change in cost required to produce one more unit of output.
 - the change in output that can be obtained from one more dollar of expenditure.
 - the change in output that results from one more unit of an input.
 - the change in revenue from the production of one more unit of output.
 - the level of output divided by the level of input.
7. What is the shutdown rule for a firm in the short-run?
- In the short-run, the firm should continue to produce if total revenue (TR) exceeds total variable costs (TVC) and total fixed costs (TFC) are all sunk; otherwise, it should shut down.
 - In the short-run, the firm should continue to produce if total revenue (TR) exceeds total costs (TC); otherwise, it should shut down.
 - In the short-run, if some fixed costs are not sunk, the firm should continue to produce if $(TR - TVC) > (TFC - \text{sunk fixed costs}) > 0$; otherwise, it should shut down.
 - In the short-run, the firm should continue to produce if total revenue (TR) is less than total variable costs.
 - Both a and c are reasonable rules.
8. We say that a firm experiences *diseconomies of scale* or decreasing returns to size when
- AC is decreasing.
 - $AC > MC$.
 - $MC > AC$.
 - ϵ_s (elasticity of scale) > 1 .
 - the firm imposes costs on outside firms.

9. Consider the following table which shows the minimum cost way to produce various levels of output for a firm. Assume that the price of output is \$4.36. How much output should the firm produce? The prices of inputs are given by w_1 and w_2 . Marginal cost is abbreviated as MC. APP_i is the average physical product of the i th input while MPP_i is the marginal physical product of the i th input. MRS represents the marginal rate of substitution.

x_1	x_2	w_1	w_2	Output	Revenue	Cost	MC	Profit	APP_1	APP_2	MPP_1	MPP_2	MRS	w_2/w_1
10.196	11.370	60.00	28.00	365.0	1460.0	930.146	3.75	529.854	35.797	32.102	15.977	7.456	-0.467	-0.467
10.903	11.924	60.00	28.00	380.0	1520.0	988.031	3.96	531.969	34.854	31.869	15.118	7.055	-0.467	-0.467
11.000	12.000	60.00	28.00	382.0	1528.0	996.000	4.00	532.000	34.727	31.833	15.000	7.000	-0.467	-0.467
11.397	12.311	60.00	28.00	390.0	1560.0	1028.523	4.13	531.477	34.220	31.679	14.517	6.775	-0.467	-0.467
12.018	12.798	60.00	28.00	402.0	1608.0	1079.445	4.36	528.555	33.449	31.411	13.762	6.422	-0.467	-0.467
13.020	13.584	60.00	28.00	420.0	1680.0	1161.560	4.78	518.440	32.257	30.920	12.543	5.853	-0.467	-0.467
15.705	15.687	60.00	28.00	460.0	1840.0	1381.534	6.46	458.466	29.291	29.323	9.278	4.330	-0.467	-0.467
15.864	15.813	60.00	28.00	462.0	1848.0	1394.604	6.60	453.396	29.122	29.217	9.084	4.239	-0.467	-0.467
16.027	15.940	60.00	28.00	464.0	1856.0	1407.960	6.75	448.040	28.951	29.109	8.886	4.147	-0.467	-0.467
16.540	16.342	60.00	28.00	470.0	1880.0	1449.946	7.26	430.054	28.417	28.761	8.263	3.856	-0.467	-0.467
17.493	17.089	60.00	28.00	480.0	1920.0	1528.039	8.44	391.961	27.440	28.089	7.104	3.315	-0.467	-0.467
17.702	17.253	60.00	28.00	482.0	1928.0	1545.241	8.76	382.759	27.228	27.937	6.848	3.196	-0.467	-0.467

- 380
- 382
- 402
- 460
- Cannot tell from the data

10. Consider the following table which shows cost and revenue data for a specific firm. Y denotes output, FC denotes fixed cost, VC denotes variable cost, C represents cost, AFC is average fixed cost, AVC is average variable cost, ATC is average total cost, and MC is marginal cost. TR is total revenue and MR is marginal revenue. How much output should the firm produce?

Y	FC	VC	C	AFC	AVC	ATC	MC	Price	TR	MR
0.00	100	0.00	100.00					275	0	275
1.00	100	79.00	179.00	100.00	79.00	179.00	79.00	261	261	247
2.00	100	160.00	260.00	50.00	80.00	130.00	84.00	247	494	219
3.00	100	249.00	349.00	33.33	83.00	116.33	95.00	233	699	191
4.00	100	352.00	452.00	25.00	88.00	113.00	112.00	219	876	163
5.00	100	475.00	575.00	20.00	95.00	115.00	135.00	205	1025	135
6.00	100	624.00	724.00	16.67	104.00	120.67	164.00	191	1146	107
7.00	100	805.00	905.00	14.29	115.00	129.29	199.00	177	1239	79
8.00	100	1024.00	1124.00	12.50	128.00	140.50	240.00	163	1304	51
9.00	100	1287.00	1387.00	11.11	143.00	154.11	287.00	149	1341	23
10.00	100	1600.00	1700.00	10.00	160.00	170.00	340.00	135	1350	-5
11.00	100	1969.00	2069.00	9.09	179.00	188.09	399.00	121	1331	-33

- 5
- 3
- 2
- 7
- 8

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Answer Key

Question	Correct Answer
1	e
2	e
3	c
4	b
5	d
6	d
7	e
8	c
9	c
10	a