

Economics 101
Spring 2001
Section 4 - Hallam
Quiz 8

1. 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 \$6.60. 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	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	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	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	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	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	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	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	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	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	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	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	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	27.228	27.937	6.848	3.196	-0.467	-0.467

- a. 380
b. 462
c. 402
d. 460
e. Cannot tell from the data
2. 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 \$4.00. 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	MC	APP_1	APP_2	MPP_1	MPP_2	MRS	w_2/w_1
5.227	5.937	40.00	24.00	300.000	1.29	57.394	50.529	30.966	18.580	-0.600	-0.600
6.000	7.000	40.00	24.00	343.000	1.33	57.167	49.000	30.000	18.000	-0.600	-0.600
6.686	7.943	40.00	24.00	380.000	1.37	56.839	47.843	29.143	17.486	-0.600	-0.600
7.567	9.155	40.00	24.00	426.000	1.43	56.296	46.533	28.041	16.825	-0.600	-0.600
12.234	15.572	40.00	24.00	640.000	1.80	52.312	41.099	22.207	13.324	-0.600	-0.600
13.782	17.701	40.00	24.00	700.000	1.97	50.790	39.547	20.272	12.163	-0.600	-0.600
14.193	18.265	40.00	24.00	715.000	2.02	50.377	39.145	19.759	11.855	-0.600	-0.600
14.902	19.240	40.00	24.00	740.000	2.12	49.657	38.461	18.872	11.323	-0.600	-0.600
17.162	22.347	40.00	24.00	812.000	2.49	47.315	36.335	16.048	9.629	-0.600	-0.600
22.000	29.000	40.00	24.00	927.000	4.00	42.136	31.966	10.000	6.000	-0.600	-0.600
22.747	30.027	40.00	24.00	940.000	4.41	41.324	31.305	9.066	5.440	-0.600	-0.600
25.045	33.187	40.00	24.00	972.000	6.46	38.810	29.288	6.193	3.716	-0.600	-0.600

- a. 300
b. 343
c. 927
d. 700
e. All the choices are profit maximizing

3. Consider the following table which shows cost and revenue data for a specific price setting firm. Y denotes output, FC denotes fixed cost, VC denotes variable cost, C represents total 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	120	0.00	120.00					384	0	384
1.00	120	61.00	181.00	120.00	61.00	181.00	64.00	374	374	364
2.00	120	132.00	252.00	60.00	66.00	126.00	80.00	364	728	344
3.00	120	225.00	345.00	40.00	75.00	115.00	108.00	354	1062	324
4.00	120	352.00	472.00	30.00	88.00	118.00	148.00	344	1376	304
5.00	120	525.00	645.00	24.00	105.00	129.00	200.00	334	1670	284
6.00	120	756.00	876.00	20.00	126.00	146.00	264.00	324	1944	264
7.00	120	1057.00	1177.00	17.14	151.00	168.14	340.00	314	2198	244
8.00	120	1440.00	1560.00	15.00	180.00	195.00	428.00	304	2432	224
9.00	120	1917.00	2037.00	13.33	213.00	226.33	528.00	294	2646	204
10.00	120	2500.00	2620.00	12.00	250.00	262.00	640.00	284	2840	184
11.00	120	3201.00	3321.00	10.91	291.00	301.91	764.00	274	3014	164

- a. 5
b. 3
c. 2
d. 7
e. 6
4. We say that a firm experiences *diseconomies of scale* or decreasing returns to size when
- a. AC is decreasing.
b. $AC > MC$.
c. $MC > AC$.
d. ϵ_s (elasticity of scale) > 1 .
e. the firm imposes costs on outside firms.
5. 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 total 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

- a. 5
b. 3
c. 2
d. 7
e. 8

6. Consider a firm with the following cost function.

$$\text{cost}(y) = 81 + 20y + 0.25y^2$$

Assume that in the long run, all costs are avoidable. Marginal cost is given by

$$MC(y) = 20 + 0.5y$$

Average cost reaches its minimum at the point where it is equal to marginal cost.

From a long-run perspective, what is the level of y at which average cost is minimized?

- a. 3
 - b. $9\sqrt{2}$
 - c. 9
 - d. 18
 - e. $9\sqrt{3}$
7. For the firm in problem 6, how high does the price need to be for the firm to continue operating in the long run?
- a. 35
 - b. 29.55
 - c. 31.25
 - d. 29
 - e. 32
8. What is the long run supply function for the firm in problem 6?
- a. $y = 0$ if $p \leq 32$, $y = 2p - 40$ if $p \geq 32$
 - b. $y = 0$ if $p \leq 29$, $y = 2p - 40$ if $p \geq 29$
 - c. $y = 0$ if $p \leq 31.25$, $y = \frac{1}{2}p - 10$ if $p \geq 31.25$
 - d. $y = 0$ if $p \leq 32$, $y = 2p - 20$ if $p \geq 32$
 - e. $y = 0$ if $p \leq 32$, $y = \frac{1}{2}p - 10$ if $p \geq 32$

Consider the table on the next page for question 9 where y is output, LRTC is long run total cost, LRATC is long run average total cost, LRMC is long run marginal cost, SRAC is short run average total cost, SRMC is short run marginal cost, and the number after SRAC denotes plant size.

9. If the price was permanently \$287, how much should the firm produce?
- a. 4
 - b. 12
 - c. 13
 - d. 10
 - e. can't tell from the data

y	LRTC	LRATC	LRMC	SRAC 4	SRMC 4	SRAC 12	SRMC 12	SRAC 16	SRMC 16	SRAC 18	SRMC 18
0.00	0.00										
1.00	281.00	281.00	263.00	371.00	203.00	1491.00	43.00	2531.00		3171.00	
2.00	528.00	264.00	232.00	284.00	192.00	764.00	32.00	1244.00		1544.00	
3.00	747.00	249.00	207.00	252.33	187.00	519.00	27.00	812.33		999.00	
4.00	944.00	236.00	188.00	236.00	188.00	396.00	28.00	596.00		726.00	
5.00	1125.00	225.00	175.00	227.00	195.00	323.00	35.00	467.00		563.00	
6.00	1296.00	216.00	168.00	222.67	208.00	276.00	48.00	382.67		456.00	
7.00	1463.00	209.00	167.00	221.86	227.00	244.71	67.00	324.71		381.86	
8.00	1632.00	204.00	172.00	224	252.00	224.00	92.00	284.00	12.00	329.00	
9.00	1809.00	201.00	183.00	228.78	283.00	211.00	123.00	255.44	43.00	291.00	3.00
10.00	2000.00	200.00	200.00	236.00	320.00	204.00	160.00	236.00	80.00	264.00	40.00
11.00	2211.00	201.00	223.00	245.55	363.00	201.91	203.00	223.73	123.00	245.55	83.00
12.00	2448.00	204.00	252.00	257.33	412.00	204.00	252.00	217.33	172.00	234.00	132.00
13.00	2717.00	209.00	287.00	271.31	467.00	209.77	307.00	215.92	227.00	228.23	187.00
14.00	3024.00	216.00	328.00	287.43	528.00	218.86	368.00	218.86	288.00	227.43	248.00
15.00	3375.00	225.00	375.00	305.67	595.00	231.00	435.00	225.67	355.00	231.00	315.00
16.00	3776.00	236.00	428.00	326.00	668.00	246.00	508.00	236.00	428.00	238.50	388.00
17.00	4233.00	249.00	487.00	348.41	747.00	263.71	587.00	249.59	507.00	249.59	467.00
18.00	4752.00	264.00	552.00	372.89	832.00	284.00	672.00	266.22	592.00	264.00	552.00
19.00	5339.00	281.00	623.00	399.42	923.00	306.79	763.00	285.74	683.00	281.53	643.00
20.00	6000.00	300.00	700.00	428.00	1020.00	332.00	860.00	308.00	780.00	302.00	740.00
22.00	7568.00	344.00	872.00	491.27	1232.00	389.45	1072.00	360.36	992.00	351.27	952.00
23.00	8487.00	369.00	967.00	525.96	1347.00	421.61	1187.00	390.30	1107.00	379.87	1067.00
25.00	10625.00	425.00	1175.00	601.40	1595.00	492.60	1435.00	457.40	1355.00	444.60	1315.00
26.00	11856.00	456.00	1288.00	642.15	1728.00	531.38	1568.00	494.46	1488.00	480.62	1448.00
28.00	14672.00	524.00	1532.00	729.71	2012.00	615.43	1852.00	575.43	1772.00	559.71	1732.00
30.00	18000.00	600.00	1800.00	825.33	2320.00	708.00	2160.00	665.33	2080.00	648.00	2040.00

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Answer Key

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

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e. Cannot tell from the data
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6.00	120	756.00	876.00	20.00	126.00	146.00	264.00	324	1944	264
7.00	120	1057.00	1177.00	17.14	151.00	168.14	340.00	314	2198	244
8.00	120	1440.00	1560.00	15.00	180.00	195.00	428.00	304	2432	224
9.00	120	1917.00	2037.00	13.33	213.00	226.33	528.00	294	2646	204
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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

- a. 5
b. 3
c. 2
d. 7
e. 8

6. Consider a firm with the following cost function.

$$\text{cost}(y) = 81 + 20y + 0.25y^2$$

Assume that in the long run, all costs are avoidable. Marginal cost is given by

$$MC(y) = 20 + 0.5y$$

Average cost reaches its minimum at the point where it is equal to marginal cost.

From a long-run perspective, what is the level of y at which average cost is minimized?

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 - d. 18
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7. For the firm in problem 6, how high does the price need to be for the firm to continue operating in the long run?
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- a. $y = 0$ if $p \leq 32$, $y = 2p - 40$ if $p \geq 32$
 - b. $y = 0$ if $p \leq 29$, $y = 2p - 40$ if $p \geq 29$
 - c. $y = 0$ if $p \leq 31.25$, $y = \frac{1}{2}p - 10$ if $p \geq 31.25$
 - d. $y = 0$ if $p \leq 32$, $y = 2p - 20$ if $p \geq 32$
 - e. $y = 0$ if $p \leq 32$, $y = \frac{1}{2}p - 10$ if $p \geq 32$

Consider the table on the next page for question 9 where y is output, LRTC is long run total cost, LRATC is long run average total cost, LRMC is long run marginal cost, SRAC is short run average total cost, SRMC is short run marginal cost, and the number after SRAC denotes plant size.

9. If the price was permanently \$287, how much should the firm produce?
- a. 4
 - b. 12
 - c. 13
 - d. 10
 - e. can't tell from the data

y	LRTC	LRATC	LRMC	SRAC 4	SRMC 4	SRAC 12	SRMC 12	SRAC 16	SRMC 16	SRAC 18	SRMC 18
0.00	0.00										
1.00	281.00	281.00	263.00	371.00	203.00	1491.00	43.00	2531.00		3171.00	
2.00	528.00	264.00	232.00	284.00	192.00	764.00	32.00	1244.00		1544.00	
3.00	747.00	249.00	207.00	252.33	187.00	519.00	27.00	812.33		999.00	
4.00	944.00	236.00	188.00	236.00	188.00	396.00	28.00	596.00		726.00	
5.00	1125.00	225.00	175.00	227.00	195.00	323.00	35.00	467.00		563.00	
6.00	1296.00	216.00	168.00	222.67	208.00	276.00	48.00	382.67		456.00	
7.00	1463.00	209.00	167.00	221.86	227.00	244.71	67.00	324.71		381.86	
8.00	1632.00	204.00	172.00	224	252.00	224.00	92.00	284.00	12.00	329.00	
9.00	1809.00	201.00	183.00	228.78	283.00	211.00	123.00	255.44	43.00	291.00	3.00
10.00	2000.00	200.00	200.00	236.00	320.00	204.00	160.00	236.00	80.00	264.00	40.00
11.00	2211.00	201.00	223.00	245.55	363.00	201.91	203.00	223.73	123.00	245.55	83.00
12.00	2448.00	204.00	252.00	257.33	412.00	204.00	252.00	217.33	172.00	234.00	132.00
13.00	2717.00	209.00	287.00	271.31	467.00	209.77	307.00	215.92	227.00	228.23	187.00
14.00	3024.00	216.00	328.00	287.43	528.00	218.86	368.00	218.86	288.00	227.43	248.00
15.00	3375.00	225.00	375.00	305.67	595.00	231.00	435.00	225.67	355.00	231.00	315.00
16.00	3776.00	236.00	428.00	326.00	668.00	246.00	508.00	236.00	428.00	238.50	388.00
17.00	4233.00	249.00	487.00	348.41	747.00	263.71	587.00	249.59	507.00	249.59	467.00
18.00	4752.00	264.00	552.00	372.89	832.00	284.00	672.00	266.22	592.00	264.00	552.00
19.00	5339.00	281.00	623.00	399.42	923.00	306.79	763.00	285.74	683.00	281.53	643.00
20.00	6000.00	300.00	700.00	428.00	1020.00	332.00	860.00	308.00	780.00	302.00	740.00
22.00	7568.00	344.00	872.00	491.27	1232.00	389.45	1072.00	360.36	992.00	351.27	952.00
23.00	8487.00	369.00	967.00	525.96	1347.00	421.61	1187.00	390.30	1107.00	379.87	1067.00
25.00	10625.00	425.00	1175.00	601.40	1595.00	492.60	1435.00	457.40	1355.00	444.60	1315.00
26.00	11856.00	456.00	1288.00	642.15	1728.00	531.38	1568.00	494.46	1488.00	480.62	1448.00
28.00	14672.00	524.00	1532.00	729.71	2012.00	615.43	1852.00	575.43	1772.00	559.71	1732.00
30.00	18000.00	600.00	1800.00	825.33	2320.00	708.00	2160.00	665.33	2080.00	648.00	2040.00

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

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Quiz 8

1. 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 \$6.60. 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	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	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	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	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	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	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	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	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	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	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	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	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	27.228	27.937	6.848	3.196	-0.467	-0.467

- a. 380
b. 462
c. 402
d. 460
e. Cannot tell from the data
2. 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 \$4.00. 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	MC	APP_1	APP_2	MPP_1	MPP_2	MRS	w_2/w_1
5.227	5.937	40.00	24.00	300.000	1.29	57.394	50.529	30.966	18.580	-0.600	-0.600
6.000	7.000	40.00	24.00	343.000	1.33	57.167	49.000	30.000	18.000	-0.600	-0.600
6.686	7.943	40.00	24.00	380.000	1.37	56.839	47.843	29.143	17.486	-0.600	-0.600
7.567	9.155	40.00	24.00	426.000	1.43	56.296	46.533	28.041	16.825	-0.600	-0.600
12.234	15.572	40.00	24.00	640.000	1.80	52.312	41.099	22.207	13.324	-0.600	-0.600
13.782	17.701	40.00	24.00	700.000	1.97	50.790	39.547	20.272	12.163	-0.600	-0.600
14.193	18.265	40.00	24.00	715.000	2.02	50.377	39.145	19.759	11.855	-0.600	-0.600
14.902	19.240	40.00	24.00	740.000	2.12	49.657	38.461	18.872	11.323	-0.600	-0.600
17.162	22.347	40.00	24.00	812.000	2.49	47.315	36.335	16.048	9.629	-0.600	-0.600
22.000	29.000	40.00	24.00	927.000	4.00	42.136	31.966	10.000	6.000	-0.600	-0.600
22.747	30.027	40.00	24.00	940.000	4.41	41.324	31.305	9.066	5.440	-0.600	-0.600
25.045	33.187	40.00	24.00	972.000	6.46	38.810	29.288	6.193	3.716	-0.600	-0.600

- a. 300
b. 343
c. 927
d. 700
e. All the choices are profit maximizing

3. Consider the following table which shows cost and revenue data for a specific price setting firm. Y denotes output, FC denotes fixed cost, VC denotes variable cost, C represents total 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	120	0.00	120.00					384	0	384
1.00	120	61.00	181.00	120.00	61.00	181.00	64.00	374	374	364
2.00	120	132.00	252.00	60.00	66.00	126.00	80.00	364	728	344
3.00	120	225.00	345.00	40.00	75.00	115.00	108.00	354	1062	324
4.00	120	352.00	472.00	30.00	88.00	118.00	148.00	344	1376	304
5.00	120	525.00	645.00	24.00	105.00	129.00	200.00	334	1670	284
6.00	120	756.00	876.00	20.00	126.00	146.00	264.00	324	1944	264
7.00	120	1057.00	1177.00	17.14	151.00	168.14	340.00	314	2198	244
8.00	120	1440.00	1560.00	15.00	180.00	195.00	428.00	304	2432	224
9.00	120	1917.00	2037.00	13.33	213.00	226.33	528.00	294	2646	204
10.00	120	2500.00	2620.00	12.00	250.00	262.00	640.00	284	2840	184
11.00	120	3201.00	3321.00	10.91	291.00	301.91	764.00	274	3014	164

- a. 5
b. 3
c. 2
d. 7
e. 6
4. We say that a firm experiences *diseconomies of scale* or decreasing returns to size when
- a. AC is decreasing.
b. $AC > MC$.
c. $MC > AC$.
d. ϵ_s (elasticity of scale) > 1 .
e. the firm imposes costs on outside firms.
5. 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 total 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

- a. 5
b. 3
c. 2
d. 7
e. 8

6. Consider a firm with the following cost function.

$$\text{cost}(y) = 81 + 20y + 0.25y^2$$

Assume that in the long run, all costs are avoidable. Marginal cost is given by

$$MC(y) = 20 + 0.5y$$

Average cost reaches its minimum at the point where it is equal to marginal cost.

From a long-run perspective, what is the level of y at which average cost is minimized?

- 3
 - $9\sqrt{2}$
 - 9
 - 18
 - $9\sqrt{3}$
7. For the firm in problem 6, how high does the price need to be for the firm to continue operating in the long run?
- 35
 - 29.55
 - 31.25
 - 29
 - 32
8. What is the long run supply function for the firm in problem 6?
- $y = 0$ if $p \leq 32$, $y = 2p - 40$ if $p \geq 32$
 - $y = 0$ if $p \leq 29$, $y = 2p - 40$ if $p \geq 29$
 - $y = 0$ if $p \leq 31.25$, $y = \frac{1}{2}p - 10$ if $p \geq 31.25$
 - $y = 0$ if $p \leq 32$, $y = 2p - 20$ if $p \geq 32$
 - $y = 0$ if $p \leq 32$, $y = \frac{1}{2}p - 10$ if $p \geq 32$

Consider the table on the next page for question 9 where y is output, LRTC is long run total cost, LRATC is long run average total cost, LRMC is long run marginal cost, SRAC is short run average total cost, SRMC is short run marginal cost, and the number after SRAC denotes plant size.

9. If the price was permanently \$287, how much should the firm produce?
- 4
 - 12
 - 13
 - 10
 - can't tell from the data

y	LRTC	LRATC	LRMC	SRAC 4	SRMC 4	SRAC 12	SRMC 12	SRAC 16	SRMC 16	SRAC 18	SRMC 18
0.00	0.00										
1.00	281.00	281.00	263.00	371.00	203.00	1491.00	43.00	2531.00		3171.00	
2.00	528.00	264.00	232.00	284.00	192.00	764.00	32.00	1244.00		1544.00	
3.00	747.00	249.00	207.00	252.33	187.00	519.00	27.00	812.33		999.00	
4.00	944.00	236.00	188.00	236.00	188.00	396.00	28.00	596.00		726.00	
5.00	1125.00	225.00	175.00	227.00	195.00	323.00	35.00	467.00		563.00	
6.00	1296.00	216.00	168.00	222.67	208.00	276.00	48.00	382.67		456.00	
7.00	1463.00	209.00	167.00	221.86	227.00	244.71	67.00	324.71		381.86	
8.00	1632.00	204.00	172.00	224	252.00	224.00	92.00	284.00	12.00	329.00	
9.00	1809.00	201.00	183.00	228.78	283.00	211.00	123.00	255.44	43.00	291.00	3.00
10.00	2000.00	200.00	200.00	236.00	320.00	204.00	160.00	236.00	80.00	264.00	40.00
11.00	2211.00	201.00	223.00	245.55	363.00	201.91	203.00	223.73	123.00	245.55	83.00
12.00	2448.00	204.00	252.00	257.33	412.00	204.00	252.00	217.33	172.00	234.00	132.00
13.00	2717.00	209.00	287.00	271.31	467.00	209.77	307.00	215.92	227.00	228.23	187.00
14.00	3024.00	216.00	328.00	287.43	528.00	218.86	368.00	218.86	288.00	227.43	248.00
15.00	3375.00	225.00	375.00	305.67	595.00	231.00	435.00	225.67	355.00	231.00	315.00
16.00	3776.00	236.00	428.00	326.00	668.00	246.00	508.00	236.00	428.00	238.50	388.00
17.00	4233.00	249.00	487.00	348.41	747.00	263.71	587.00	249.59	507.00	249.59	467.00
18.00	4752.00	264.00	552.00	372.89	832.00	284.00	672.00	266.22	592.00	264.00	552.00
19.00	5339.00	281.00	623.00	399.42	923.00	306.79	763.00	285.74	683.00	281.53	643.00
20.00	6000.00	300.00	700.00	428.00	1020.00	332.00	860.00	308.00	780.00	302.00	740.00
22.00	7568.00	344.00	872.00	491.27	1232.00	389.45	1072.00	360.36	992.00	351.27	952.00
23.00	8487.00	369.00	967.00	525.96	1347.00	421.61	1187.00	390.30	1107.00	379.87	1067.00
25.00	10625.00	425.00	1175.00	601.40	1595.00	492.60	1435.00	457.40	1355.00	444.60	1315.00
26.00	11856.00	456.00	1288.00	642.15	1728.00	531.38	1568.00	494.46	1488.00	480.62	1448.00
28.00	14672.00	524.00	1532.00	729.71	2012.00	615.43	1852.00	575.43	1772.00	559.71	1732.00
30.00	18000.00	600.00	1800.00	825.33	2320.00	708.00	2160.00	665.33	2080.00	648.00	2040.00

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Answer Key

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

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1. 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 \$6.60. 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	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	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	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	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	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	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	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	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	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	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	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	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	27.228	27.937	6.848	3.196	-0.467	-0.467

- a. 380
b. 462
c. 402
d. 460
e. Cannot tell from the data
2. 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 \$4.00. 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	MC	APP_1	APP_2	MPP_1	MPP_2	MRS	w_2/w_1
5.227	5.937	40.00	24.00	300.000	1.29	57.394	50.529	30.966	18.580	-0.600	-0.600
6.000	7.000	40.00	24.00	343.000	1.33	57.167	49.000	30.000	18.000	-0.600	-0.600
6.686	7.943	40.00	24.00	380.000	1.37	56.839	47.843	29.143	17.486	-0.600	-0.600
7.567	9.155	40.00	24.00	426.000	1.43	56.296	46.533	28.041	16.825	-0.600	-0.600
12.234	15.572	40.00	24.00	640.000	1.80	52.312	41.099	22.207	13.324	-0.600	-0.600
13.782	17.701	40.00	24.00	700.000	1.97	50.790	39.547	20.272	12.163	-0.600	-0.600
14.193	18.265	40.00	24.00	715.000	2.02	50.377	39.145	19.759	11.855	-0.600	-0.600
14.902	19.240	40.00	24.00	740.000	2.12	49.657	38.461	18.872	11.323	-0.600	-0.600
17.162	22.347	40.00	24.00	812.000	2.49	47.315	36.335	16.048	9.629	-0.600	-0.600
22.000	29.000	40.00	24.00	927.000	4.00	42.136	31.966	10.000	6.000	-0.600	-0.600
22.747	30.027	40.00	24.00	940.000	4.41	41.324	31.305	9.066	5.440	-0.600	-0.600
25.045	33.187	40.00	24.00	972.000	6.46	38.810	29.288	6.193	3.716	-0.600	-0.600

- a. 300
b. 343
c. 927
d. 700
e. All the choices are profit maximizing

3. Consider the following table which shows cost and revenue data for a specific price setting firm. Y denotes output, FC denotes fixed cost, VC denotes variable cost, C represents total 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	120	0.00	120.00					384	0	384
1.00	120	61.00	181.00	120.00	61.00	181.00	64.00	374	374	364
2.00	120	132.00	252.00	60.00	66.00	126.00	80.00	364	728	344
3.00	120	225.00	345.00	40.00	75.00	115.00	108.00	354	1062	324
4.00	120	352.00	472.00	30.00	88.00	118.00	148.00	344	1376	304
5.00	120	525.00	645.00	24.00	105.00	129.00	200.00	334	1670	284
6.00	120	756.00	876.00	20.00	126.00	146.00	264.00	324	1944	264
7.00	120	1057.00	1177.00	17.14	151.00	168.14	340.00	314	2198	244
8.00	120	1440.00	1560.00	15.00	180.00	195.00	428.00	304	2432	224
9.00	120	1917.00	2037.00	13.33	213.00	226.33	528.00	294	2646	204
10.00	120	2500.00	2620.00	12.00	250.00	262.00	640.00	284	2840	184
11.00	120	3201.00	3321.00	10.91	291.00	301.91	764.00	274	3014	164

- a. 5
b. 3
c. 2
d. 7
e. 6
4. We say that a firm experiences *diseconomies of scale* or decreasing returns to size when
- a. AC is decreasing.
b. $AC > MC$.
c. $MC > AC$.
d. ϵ_s (elasticity of scale) > 1 .
e. the firm imposes costs on outside firms.
5. 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 total 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

- a. 5
b. 3
c. 2
d. 7
e. 8

6. Consider a firm with the following cost function.

$$\text{cost}(y) = 81 + 20y + 0.25y^2$$

Assume that in the long run, all costs are avoidable. Marginal cost is given by

$$MC(y) = 20 + 0.5y$$

Average cost reaches its minimum at the point where it is equal to marginal cost.

From a long-run perspective, what is the level of y at which average cost is minimized?

- 3
 - $9\sqrt{2}$
 - 9
 - 18
 - $9\sqrt{3}$
7. For the firm in problem 6, how high does the price need to be for the firm to continue operating in the long run?
- 35
 - 29.55
 - 31.25
 - 29
 - 32
8. What is the long run supply function for the firm in problem 6?
- $y = 0$ if $p \leq 32$, $y = 2p - 40$ if $p \geq 32$
 - $y = 0$ if $p \leq 29$, $y = 2p - 40$ if $p \geq 29$
 - $y = 0$ if $p \leq 31.25$, $y = \frac{1}{2}p - 10$ if $p \geq 31.25$
 - $y = 0$ if $p \leq 32$, $y = 2p - 20$ if $p \geq 32$
 - $y = 0$ if $p \leq 32$, $y = \frac{1}{2}p - 10$ if $p \geq 32$

Consider the table on the next page for question 9 where y is output, LRTC is long run total cost, LRATC is long run average total cost, LRMC is long run marginal cost, SRAC is short run average total cost, SRMC is short run marginal cost, and the number after SRAC denotes plant size.

9. If the price was permanently \$287, how much should the firm produce?
- 4
 - 12
 - 13
 - 10
 - can't tell from the data

y	LRTC	LRATC	LRMC	SRAC 4	SRMC 4	SRAC 12	SRMC 12	SRAC 16	SRMC 16	SRAC 18	SRMC 18
0.00	0.00										
1.00	281.00	281.00	263.00	371.00	203.00	1491.00	43.00	2531.00		3171.00	
2.00	528.00	264.00	232.00	284.00	192.00	764.00	32.00	1244.00		1544.00	
3.00	747.00	249.00	207.00	252.33	187.00	519.00	27.00	812.33		999.00	
4.00	944.00	236.00	188.00	236.00	188.00	396.00	28.00	596.00		726.00	
5.00	1125.00	225.00	175.00	227.00	195.00	323.00	35.00	467.00		563.00	
6.00	1296.00	216.00	168.00	222.67	208.00	276.00	48.00	382.67		456.00	
7.00	1463.00	209.00	167.00	221.86	227.00	244.71	67.00	324.71		381.86	
8.00	1632.00	204.00	172.00	224	252.00	224.00	92.00	284.00	12.00	329.00	
9.00	1809.00	201.00	183.00	228.78	283.00	211.00	123.00	255.44	43.00	291.00	3.00
10.00	2000.00	200.00	200.00	236.00	320.00	204.00	160.00	236.00	80.00	264.00	40.00
11.00	2211.00	201.00	223.00	245.55	363.00	201.91	203.00	223.73	123.00	245.55	83.00
12.00	2448.00	204.00	252.00	257.33	412.00	204.00	252.00	217.33	172.00	234.00	132.00
13.00	2717.00	209.00	287.00	271.31	467.00	209.77	307.00	215.92	227.00	228.23	187.00
14.00	3024.00	216.00	328.00	287.43	528.00	218.86	368.00	218.86	288.00	227.43	248.00
15.00	3375.00	225.00	375.00	305.67	595.00	231.00	435.00	225.67	355.00	231.00	315.00
16.00	3776.00	236.00	428.00	326.00	668.00	246.00	508.00	236.00	428.00	238.50	388.00
17.00	4233.00	249.00	487.00	348.41	747.00	263.71	587.00	249.59	507.00	249.59	467.00
18.00	4752.00	264.00	552.00	372.89	832.00	284.00	672.00	266.22	592.00	264.00	552.00
19.00	5339.00	281.00	623.00	399.42	923.00	306.79	763.00	285.74	683.00	281.53	643.00
20.00	6000.00	300.00	700.00	428.00	1020.00	332.00	860.00	308.00	780.00	302.00	740.00
22.00	7568.00	344.00	872.00	491.27	1232.00	389.45	1072.00	360.36	992.00	351.27	952.00
23.00	8487.00	369.00	967.00	525.96	1347.00	421.61	1187.00	390.30	1107.00	379.87	1067.00
25.00	10625.00	425.00	1175.00	601.40	1595.00	492.60	1435.00	457.40	1355.00	444.60	1315.00
26.00	11856.00	456.00	1288.00	642.15	1728.00	531.38	1568.00	494.46	1488.00	480.62	1448.00
28.00	14672.00	524.00	1532.00	729.71	2012.00	615.43	1852.00	575.43	1772.00	559.71	1732.00
30.00	18000.00	600.00	1800.00	825.33	2320.00	708.00	2160.00	665.33	2080.00	648.00	2040.00

Economics 101
Spring 2001
Section 4 - Hallam
Quiz 8
Answer Key

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

Economics 101
Spring 2001
Section 4 - Hallam
Quiz 8

1. 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 \$6.60. 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	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	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	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	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	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	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	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	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	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	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	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	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	27.228	27.937	6.848	3.196	-0.467	-0.467

- a. 380
b. 462
c. 402
d. 460
e. Cannot tell from the data
2. 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 \$4.00. 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	MC	APP_1	APP_2	MPP_1	MPP_2	MRS	w_2/w_1
5.227	5.937	40.00	24.00	300.000	1.29	57.394	50.529	30.966	18.580	-0.600	-0.600
6.000	7.000	40.00	24.00	343.000	1.33	57.167	49.000	30.000	18.000	-0.600	-0.600
6.686	7.943	40.00	24.00	380.000	1.37	56.839	47.843	29.143	17.486	-0.600	-0.600
7.567	9.155	40.00	24.00	426.000	1.43	56.296	46.533	28.041	16.825	-0.600	-0.600
12.234	15.572	40.00	24.00	640.000	1.80	52.312	41.099	22.207	13.324	-0.600	-0.600
13.782	17.701	40.00	24.00	700.000	1.97	50.790	39.547	20.272	12.163	-0.600	-0.600
14.193	18.265	40.00	24.00	715.000	2.02	50.377	39.145	19.759	11.855	-0.600	-0.600
14.902	19.240	40.00	24.00	740.000	2.12	49.657	38.461	18.872	11.323	-0.600	-0.600
17.162	22.347	40.00	24.00	812.000	2.49	47.315	36.335	16.048	9.629	-0.600	-0.600
22.000	29.000	40.00	24.00	927.000	4.00	42.136	31.966	10.000	6.000	-0.600	-0.600
22.747	30.027	40.00	24.00	940.000	4.41	41.324	31.305	9.066	5.440	-0.600	-0.600
25.045	33.187	40.00	24.00	972.000	6.46	38.810	29.288	6.193	3.716	-0.600	-0.600

- a. 300
b. 343
c. 927
d. 700
e. All the choices are profit maximizing

3. Consider the following table which shows cost and revenue data for a specific price setting firm. Y denotes output, FC denotes fixed cost, VC denotes variable cost, C represents total 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	120	0.00	120.00					384	0	384
1.00	120	61.00	181.00	120.00	61.00	181.00	64.00	374	374	364
2.00	120	132.00	252.00	60.00	66.00	126.00	80.00	364	728	344
3.00	120	225.00	345.00	40.00	75.00	115.00	108.00	354	1062	324
4.00	120	352.00	472.00	30.00	88.00	118.00	148.00	344	1376	304
5.00	120	525.00	645.00	24.00	105.00	129.00	200.00	334	1670	284
6.00	120	756.00	876.00	20.00	126.00	146.00	264.00	324	1944	264
7.00	120	1057.00	1177.00	17.14	151.00	168.14	340.00	314	2198	244
8.00	120	1440.00	1560.00	15.00	180.00	195.00	428.00	304	2432	224
9.00	120	1917.00	2037.00	13.33	213.00	226.33	528.00	294	2646	204
10.00	120	2500.00	2620.00	12.00	250.00	262.00	640.00	284	2840	184
11.00	120	3201.00	3321.00	10.91	291.00	301.91	764.00	274	3014	164

- a. 5
b. 3
c. 2
d. 7
e. 6
4. We say that a firm experiences *diseconomies of scale* or decreasing returns to size when
- a. AC is decreasing.
b. $AC > MC$.
c. $MC > AC$.
d. ϵ_s (elasticity of scale) > 1 .
e. the firm imposes costs on outside firms.
5. 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 total 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

- a. 5
b. 3
c. 2
d. 7
e. 8

6. Consider a firm with the following cost function.

$$\text{cost}(y) = 81 + 20y + 0.25y^2$$

Assume that in the long run, all costs are avoidable. Marginal cost is given by

$$MC(y) = 20 + 0.5y$$

Average cost reaches its minimum at the point where it is equal to marginal cost.

From a long-run perspective, what is the level of y at which average cost is minimized?

- 3
 - $9\sqrt{2}$
 - 9
 - 18
 - $9\sqrt{3}$
7. For the firm in problem 6, how high does the price need to be for the firm to continue operating in the long run?
- 35
 - 29.55
 - 31.25
 - 29
 - 32
8. What is the long run supply function for the firm in problem 6?
- $y = 0$ if $p \leq 32$, $y = 2p - 40$ if $p \geq 32$
 - $y = 0$ if $p \leq 29$, $y = 2p - 40$ if $p \geq 29$
 - $y = 0$ if $p \leq 31.25$, $y = \frac{1}{2}p - 10$ if $p \geq 31.25$
 - $y = 0$ if $p \leq 32$, $y = 2p - 20$ if $p \geq 32$
 - $y = 0$ if $p \leq 32$, $y = \frac{1}{2}p - 10$ if $p \geq 32$

Consider the table on the next page for question 9 where y is output, LRTC is long run total cost, LRATC is long run average total cost, LRMC is long run marginal cost, SRAC is short run average total cost, SRMC is short run marginal cost, and the number after SRAC denotes plant size.

9. If the price was permanently \$287, how much should the firm produce?
- 4
 - 12
 - 13
 - 10
 - can't tell from the data

y	LRTC	LRATC	LRMC	SRAC 4	SRMC 4	SRAC 12	SRMC 12	SRAC 16	SRMC 16	SRAC 18	SRMC 18
0.00	0.00										
1.00	281.00	281.00	263.00	371.00	203.00	1491.00	43.00	2531.00		3171.00	
2.00	528.00	264.00	232.00	284.00	192.00	764.00	32.00	1244.00		1544.00	
3.00	747.00	249.00	207.00	252.33	187.00	519.00	27.00	812.33		999.00	
4.00	944.00	236.00	188.00	236.00	188.00	396.00	28.00	596.00		726.00	
5.00	1125.00	225.00	175.00	227.00	195.00	323.00	35.00	467.00		563.00	
6.00	1296.00	216.00	168.00	222.67	208.00	276.00	48.00	382.67		456.00	
7.00	1463.00	209.00	167.00	221.86	227.00	244.71	67.00	324.71		381.86	
8.00	1632.00	204.00	172.00	224	252.00	224.00	92.00	284.00	12.00	329.00	
9.00	1809.00	201.00	183.00	228.78	283.00	211.00	123.00	255.44	43.00	291.00	3.00
10.00	2000.00	200.00	200.00	236.00	320.00	204.00	160.00	236.00	80.00	264.00	40.00
11.00	2211.00	201.00	223.00	245.55	363.00	201.91	203.00	223.73	123.00	245.55	83.00
12.00	2448.00	204.00	252.00	257.33	412.00	204.00	252.00	217.33	172.00	234.00	132.00
13.00	2717.00	209.00	287.00	271.31	467.00	209.77	307.00	215.92	227.00	228.23	187.00
14.00	3024.00	216.00	328.00	287.43	528.00	218.86	368.00	218.86	288.00	227.43	248.00
15.00	3375.00	225.00	375.00	305.67	595.00	231.00	435.00	225.67	355.00	231.00	315.00
16.00	3776.00	236.00	428.00	326.00	668.00	246.00	508.00	236.00	428.00	238.50	388.00
17.00	4233.00	249.00	487.00	348.41	747.00	263.71	587.00	249.59	507.00	249.59	467.00
18.00	4752.00	264.00	552.00	372.89	832.00	284.00	672.00	266.22	592.00	264.00	552.00
19.00	5339.00	281.00	623.00	399.42	923.00	306.79	763.00	285.74	683.00	281.53	643.00
20.00	6000.00	300.00	700.00	428.00	1020.00	332.00	860.00	308.00	780.00	302.00	740.00
22.00	7568.00	344.00	872.00	491.27	1232.00	389.45	1072.00	360.36	992.00	351.27	952.00
23.00	8487.00	369.00	967.00	525.96	1347.00	421.61	1187.00	390.30	1107.00	379.87	1067.00
25.00	10625.00	425.00	1175.00	601.40	1595.00	492.60	1435.00	457.40	1355.00	444.60	1315.00
26.00	11856.00	456.00	1288.00	642.15	1728.00	531.38	1568.00	494.46	1488.00	480.62	1448.00
28.00	14672.00	524.00	1532.00	729.71	2012.00	615.43	1852.00	575.43	1772.00	559.71	1732.00
30.00	18000.00	600.00	1800.00	825.33	2320.00	708.00	2160.00	665.33	2080.00	648.00	2040.00

Economics 101
Spring 2001
Section 4 - Hallam
Quiz 8
Answer Key

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