eLearneconomics: Cost and cost-curve relationships (1)

Student response ______________________________

The table shows the typical costs for a firm.

Output (Q)	Fixed costs (FC)	Variable costs (VC)	Total costs (TC)	Average costs (AC = TC/Q)	Marginal costs (MC)	Average variable costs (AVC = VC/Q)	Average fixed costs (AFC = FC/Q)
0	250	–	250	–	–	–	–
1	250	70	320	320	70	70	250
2	250	120	370	185	50	60	125
3	250	140	390	130	20	46.67	83.33
4	250	160	410	102.5	20	40	62.5
5	250	190	440	88	30	38	50
6	250	230	480	80	40	38.33	41.67
7	250	280	530	75.71	50	40	35.71
8	250	350	600	75	70	43.75	31.25
9	250	440	690	76.67	90	48.89	27.78
10	250	540	790	79	100	54	25

(a) Write *correct* or *incorrect* for the following statements.

(i) Total costs equal average fixed costs plus average variable costs. ______________

(ii) Total costs equal average total costs multiplied by output. ______________

(iii) The additions to total costs of an additional unit of output is marginal revenue. ______________

(iv) The additions to total costs of an additional unit of output is marginal cost. ______________

(v) The gap between total costs and variable costs is a constant. ______________

(vi) The gap between total costs and variable costs equals average fixed costs. ______________

(vii) The gap between total costs and variable costs equals fixed costs. ______________

(viii) Total costs are a constant. ______________

(ix) Fixed costs continually decline as output increases. ______________

(x) At zero output there are no fixed costs. ______________

(xi) At zero output there are no variable costs. ______________

(b) Indicate if the following statements are *correct* or *incorrect.*

(i) The firm's costs, if they include economic costs, would include the implicit costs of wages for factory workers employed by the firm. ______________

(ii) If the building used by the firm was owned by the owner the implicit rent for this building should be included in economic costs. ______________

(iii) A firm's implicit costs are greater than its explicit costs. ______________

eLearneconomics: Cost and cost-curve relationships (1a)

Solutions

The table shows the typical costs for a firm.

Output (Q)	Fixed costs (FC)	Variable costs (VC)	Total costs (TC)	Average costs (AC = TC/Q)	Marginal costs (MC)	Average variable costs (AVC = VC/Q)	Average fixed costs (AFC = FC/Q)
0	250	–	250	–	–	–	–
1	250	70	320	320	70	70	250
2	250	120	370	185	50	60	125
3	250	140	390	130	20	46.67	83.33
4	250	160	410	102.5	20	40	62.5
5	250	190	440	88	30	38	50
6	250	230	480	80	40	38.33	41.67
7	250	280	530	75.71	50	40	35.71
8	250	350	600	75	70	43.75	31.25
9	250	440	690	76.67	90	48.89	27.78
10	250	540	790	79	100	54	25

(a) Write *correct* or *incorrect* for the following statements.

(i) Total costs equal average fixed costs plus average variable costs. incorrect

(ii) Total costs equal average total costs multiplied by output. correct

(iii) The additions to total costs of an additional unit of output is marginal revenue. incorrect

(iv) The additions to total costs of an additional unit of output is marginal cost. correct

(v) The gap between total costs and variable costs is a constant. correct

(vi) The gap between total costs and variable costs equals average fixed costs. incorrect

(vii) The gap between total costs and variable costs equals fixed costs. correct

(viii) Total costs are a constant. incorrect

(ix) Fixed costs continually decline as output increases. incorrect

(x) At zero output there are no fixed costs. incorrect

(xi) At zero output there are no variable costs. correct

(b) Indicate if the following statements are *correct* or *incorrect.*

(i) The firm's costs, if they include economic costs, would include the implicit costs of wages for factory workers employed by the firm. incorrect

(ii) If the building used by the firm was owned by the owner the implicit rent for this building should be included in economic costs. correct

(iii) A firm's implicit costs are greater than its explicit costs. correct

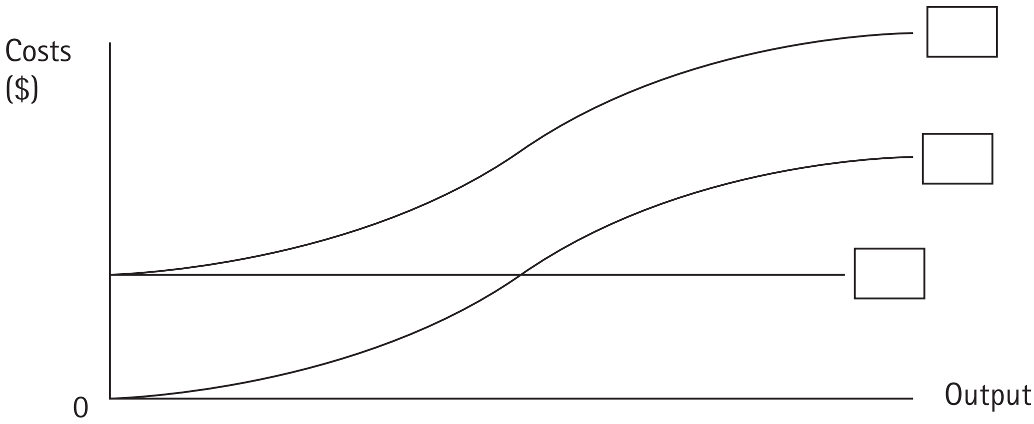
eLearneconomics: Cost and cost-curve relationships (2)

Student response ______________________________

(a) Complete the table.

Quantity	FC ($)	VC ($)	TC ($)
1			1 440
2			2 000
3		1 660	2 460
4		2 000	2 800
5		2 200	3 000
6			3 800
7	800	4 800	

(b) Label the curves using the information from the table, use the small boxes for your answers.



(c) Write whether the following 'costs' are fixed or variable.

(i) Rates ____________

(ii) Hire purchase repayments ____________

(iii) Electricity ____________

(iv) Workers' wages ____________

(v) Raw materials ____________

(vi) Stamps, postage requirements ____________

(vii) Toll calls ____________

(viii) Line rentals for phones ____________

(ix) Interest repayments on a mortgage ____________

(x) Insurance payments ____________

(xi) Gas for cars ____________

(xii) Rent for an office ____________

(d) What is meant by the term 'debt servicing'?

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____

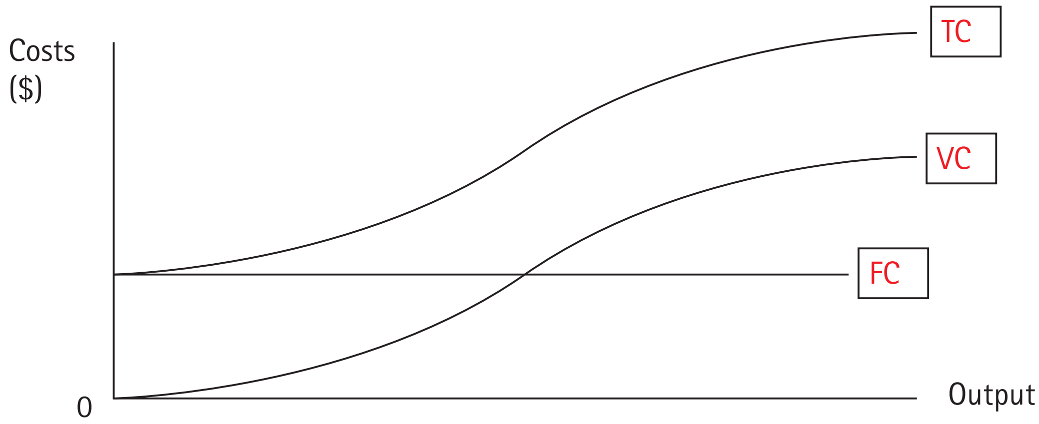
eLearneconomics: Cost and cost curve relationships (2a)

Solutions

(a) Complete the table.

Quantity	FC ($)	VC ($)	TC ($)
1	800	640	1 440
2	800	1 200	2 000
3	800	1 660	2 460
4	800	2 000	2 800
5	800	2 200	3 000
6	800	3 000	3 800
7	800	4 800	5 600

(b) Label the curves using the information from the table, use the small boxes for your answers.



(c) Write whether the following 'costs' are fixed or variable.

(i) Rates FC

(ii) Hire purchase repayments FC

(iii) Electricity VC

(iv) Workers' wages VC

(v) Raw materials VC

(vi) Stamps, postage requirements VC

(vii) Toll calls VC

(viii) Line rentals for phones FC

(ix) Interest repayments on a mortgage FC

(x) Insurance payments FC

(xi) Gas for cars VC

(xii) Rent for an office FC

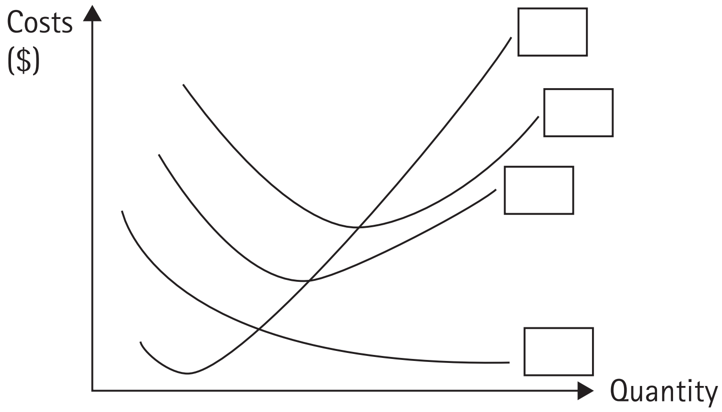
(d) What is meant by the term 'debt servicing'?

Paying interest on loans (a FC) and regular contractual repayments of principal on loan.

eLearneconomics: Cost and cost curve relationships (3)

Student response

(a) Label the curves, using the small boxes for answers.



(b) Why does the gap between the two cost curves narrow as output rises?

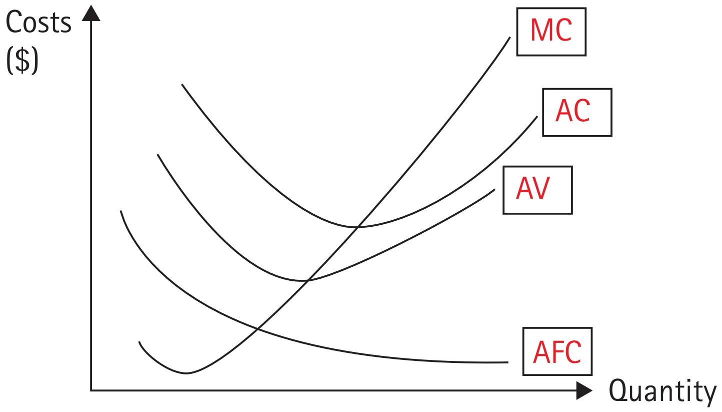
(c) What type of costs are not contained in marginal costs and why?

(d) Explain the difference between accounting and economic costs.

(e) What is the marginal cost if the average cost of production is $500 for 10 units and the average cost of 11 units is $495?

Solution

(a) Label the curves, using the small boxes for answers.



(b) Why does the gap between the two cost curves narrow as output rises?

AFC declines with increasing output because FC are spread over a greater number of units of output. This is because ATC = AFC + AVC, a higher proportion of TC will be made up of VC as output rises so the gap narrows.

(c) What type of costs are not contained in marginal costs and why?

FC are not contained in MC because FC are a constant so any change in TC, which is MC, must equal the change in VC.

(d) Explain the difference between accounting and economic costs.

Accounting costs are the actual (or explicit) costs of production, while economic costs include accounting costs as well as the implicit costs of production of the opportunity cost of alternative resource use.

(e) What is the marginal cost if the average cost of production is $500 for 10 units and the average cost of 11 units is $495?

MC = $TC_2 - TC_1$, ($495 x 11) diff ($500 x 10) = 5 445 diff 5 000 = $445

eLearneconomics: Cost and cost-curve relationships (4)

Student response ____

(a) Complete the following statements.

(i) __________ cost remains a constant for all levels of output.

(ii) __________ continuously decline as output increases.

(iii) If AC is increasing, MC must be g___________ than ________.

(iv) If MC = AC, then AC is at its ____________________________.

(v) If AC is decreasing, then MC must be l_________ than __________.

(vi) Interest rates are a major cost of production so any change in interest rates will affect __________ costs and ____________ costs.

(vii) MC is the addition to ___________ costs of an extra unit of _____________.

(viii) AFC and AVC equals ________________.

(ix) TC divided by output equals _________________.

(x) The difference between AVC and AC is equal to ________________.

(xi) Marginal costs contain no ______________ costs as they are ___________ for all levels of output so marginal cost must equal the difference in ________________ costs.

(b) Fill in the empty spaces in the table.

FC ($)	VC ($)	Output	AC ($)	TC ($)	MC ($)	AFC ($)	AVC ($)
100	900	10	100	1 000		10.00	90.00
100	945	11	95			9.09	85.91
100	980	12	90			8.33	81.67

(c) Use the table above and your notes to write *correct* or *incorrect* to these statements.

(i) FC is a constant. ________________

(ii) AFC is a constant. ________________

(iii) AFC continuously decline as output increases. ________________

(iv) AC x Q (or output) = TC ________________

(v) TC = AFC + AVC ________________

(vi) TC = FC + VC ________________

(vii) MC = (AC x Q) difference (AC' x Q'), so e.g. between 10 and 11 units
= (100 x 10) difference (95 x 11)
= 1 000 difference 1 045
= 45 ________________

(viii) AC = AFC plus AVC ________________

(ix) The change in TC between 11 and 12 units is equal to change in variable costs between 11 and 12 units. ________________

eLearneconomics: Cost and cost-curve relationships (4a)

Solutions

(a) Complete the following statements.

(i) Fixed cost remains a constant for all levels of output.

(ii) AFC continuously decline as output increases.

(iii) If AC is increasing, MC must be greater than AC.

(iv) If MC = AC, then AC is at its minimum point.

(v) If AC is decreasing, then MC must be less than AC.

(vi) Interest rates are a major cost of production so any change in interest rates will affect FC costs and total costs.

(vii) MC is the addition to total costs of an extra unit of output.

(viii) AFC and AVC equals AC (ATC).

(ix) TC divided by output equals AC (ATC).

(x) The difference between AVC and AC is equal to AFC.

(xi) Marginal costs contain no fixed costs as they are constant for all levels of output so marginal cost must equal the difference in variable costs.

(b) Fill in the empty spaces in the table.

FC ($)	VC ($)	Output	AC ($)	TC ($)	MC ($)	AFC ($)	AVC ($)
100	900	10	100	1 000		10.00	90.00
100	945	11	95	1 045	45	9.09	85.91
100	980	12	90	1 080	35	8.33	81.67

(c) Use the table above and your notes to write *correct* or *incorrect* to these statements.

(i) FC is a constant. correct

(ii) AFC is a constant. incorrect

(iii) AFC continuously decline as output increases. correct

(iv) AC x Q (or output) = TC correct

(v) TC = AFC + AVC incorrect

(vi) TC = FC + VC correct

(vii) MC = (AC x Q) difference (AC' x Q'), so e.g. between 10 and 11 units
= (100 x 10) difference (95 x 11)
= 1 000 difference 1 045
= 45 correct

(viii) AC = AFC plus AVC correct

(ix) The change in TC between 11 and 12 units is equal to change in variable costs between 11 and 12 units. correct