

DISCUSSION QUESTION

Name:

Instructor:

Course:

Suppose at some point after you graduate you decide to open a bakery that sells cupcakes. You estimate that the startup costs are equal to \$100,000. You can either borrow this \$100,000 from a bank, and pay \$1,000/month to the lender, or withdraw this amount from your savings account.

- a) Should the decision of whether you borrowed the \$100,000 or withdrew it from your savings account matter in terms of how many workers to hire, what price to charge for baked goods, or how much to spend on advertising? Why or why not?

- b) Suppose the marginal costs of making cupcakes are constant at \$1/cupcake. What are your average total costs/cupcake at $Q=1,000$ and $Q=50,000$? What concept applies to this situation?

PEER GROUP PROBLEM SOLVING

Name:

Instructor:

Course:

a) Fill in the blanks in the following table.

Q	FC	VC	TC	MC	ATC	AVC	AFC
0		\$0	\$200	--	--	--	--
10			\$500				
20		\$400					
30		\$600					
40			\$1,100			\$22.5	
50					\$32		
60				\$100			

b) At what quantity is ATC at its minimum? What is true of MC relative to ATC before and after this Q?

IN-CLASS EXPERIMENT / ACTIVE EXERCISE

Increasing marginal costs demonstration (Note: this builds on the previous diminishing returns demonstration):

Have students either break into groups of 5, or ask 5 students to volunteer to demonstrate for the rest of the class.

The instructor will need approximately 100 sheets of paper, 1 pen or sharpie, and 1 stapler (with staples) per group.

The production will involve three distinct tasks: Write a word, like “ECONOMICS”, on a sheet of paper, fold it, and staple it. The objective will be to see how many units can be produced per period (30 seconds is a reasonable amount of time per round).

Assign a cost to each worker (say \$1 per worker per round), and a fixed cost for the activity (say \$10 for the equipment and space).

Begin with one student and then add an additional student each round.

The instructor can have students calculate total costs, average costs, and marginal costs as each additional round is completed.

Total costs will start at \$10, or whatever fixed costs are assigned by the instructor. Marginal costs will rise as marginal product falls. Initially, average costs will be declining, but when marginal costs become greater than average costs, average costs will rise.

Have students explain why marginal costs rise as diminishing returns sets in. The instructor can also have students graph out the marginal cost and average cost curve, noting that when marginal costs and average costs intersect, average costs are at their minimum.

SOLUTIONS AND INSTRUCTOR NOTESDiscussion Question

Suppose at some point after you graduate you decide to open a bakery that sells cupcakes. You estimate that the startup costs are equal to \$100,000. You can either borrow this \$100,000 from a bank, and pay \$1,000/month to the lender, or withdraw this amount from your savings account.

- a) Should the decision of whether or borrowed the \$100,000 or withdrew it from your savings account matter in terms of how many workers to hire, what price to charge for baked goods, or how much to spend on advertising? Why or why not?

It should not matter, because that \$100,000, whether it's borrowed or withdrawn from your account, is a fixed cost and is not recoverable. The number of workers to hire, the price to charge, how much to spend on advertising, etc., are independent of your fixed costs.

For example, if you deem that a price of \$3.00/cupcake maximizes profit if you borrowed the \$100,000, it would also maximize profit if you withdrew the \$100,000 from your savings account.

- b) Suppose the marginal costs of making cupcakes are constant at \$1/cupcake. What are your average total costs/cupcake at $Q = 1,000$ and $Q = 50,000$? What concept applies to this situation?

Your average total costs (ATC) are equal to total costs/ Q . At $Q=1000$ your TC equals the \$100,000 startup costs + $\$1 \times 1,000$, or \$101,000, so your $ATC = \$101,000 / 1,000 = \$101 / \text{cupcake}$. At $Q = 50,000$ your TC would be the \$100,000 startup costs + $\$1 \times 50,000$, or \$150,000, so your $ATC = \$150,000 / 50,000 = \$3 / \text{cupcake}$.

As you produce more, your ATC is decreasing, which means your business is experiencing economies of scale.

Peer Group Problem Solving

a) See completed table below.

Q	FC	VC	TC	MC	ATC	AVC	AFC
0	\$200	\$0	\$200	--	--	--	--
10	\$200	\$300	\$500	\$30	\$50	\$30	\$20
20	\$200	\$400	\$600	\$10	\$30	\$20	\$10
30	\$200	\$600	\$800	\$20	\$26.7	\$20	\$6.70
40	\$200	\$900	\$1,100	\$30	\$27.5	\$22.5	\$5.00
50	\$200	\$1,400	\$1,600	\$50	\$32	\$28	\$4.00
60	\$200	\$2,400	\$2,600	\$100	\$43.33	\$40	\$3.33

b) At what quantity is ATC at its minimum? What is true of MC relative to ATC before and after this Q?

ATC reaches its minimum at $Q = 30$. For all quantities less than 30, MC is less than ATC, which is causing ATC to fall. For all quantities greater than 30, MC is greater than ATC, which is causing ATC to rise.

For more in-class experiment and active learning ideas, visit www.econedactive.com.