An Introduction to Perfect Competition

This activity explains how businesses operate and how their operation affects society. To accomplish this explanation, it is necessary to look at business costs and revenue. This analysis is based on the assumption that the goal of any business is to maximize profits.

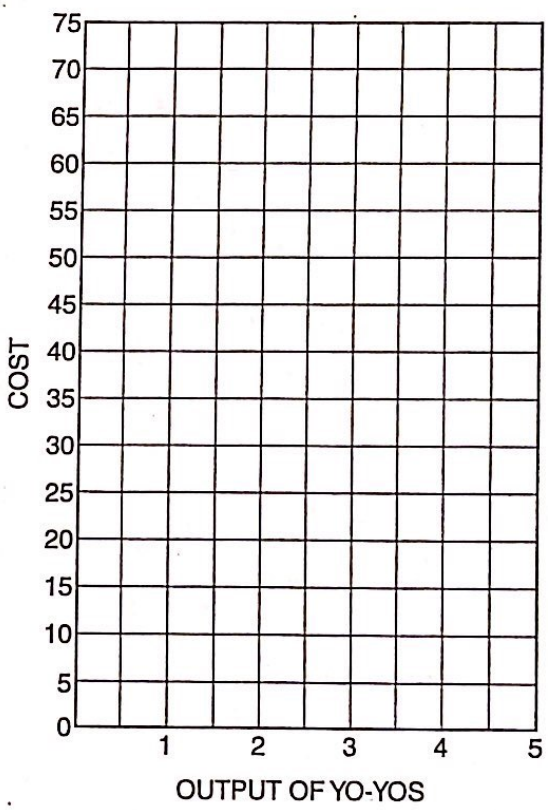
Part A

Fill in the blanks in Figure 27.1. Graph the marginal cost data from Figure 27.1 on Figure 27.2 and then answer the questions. MC is on the vertical axis, and output of yo-yos is on the horizontal axis. Plot MC on the midpoint.

Figure 27.1
Output, Total Cost and Marginal Cost

Output	Total Cost (TC)	Marginal Cost (MC)
0	$55	
1	85	
2	110	
3	130	
4	160	
5	210	

Figure 27.2
Plotting Marginal Cost of Yo-Yos



1. What is the relationship between MC and output as shown on your graph?

2. Explain why MC falls and then rises as output increases.

Activity written by John Morton, National Council on Economic Education, New York, N.Y.

Part B

Complete Figure 27.3. Assume that the firm has a total fixed cost (FC) of $100 and total variable costs (VC) as shown below. Part of the table has been completed for you.

Figure 27.3
Fixed and Variable Costs of Yo-Yos

Total Product	Fixed Cost	Variable Cost	Total Cost	Marginal Cost	Average Fixed Cost	Average Variable Cost	Average Total Cost
0	$100.00	$0	$100.00				
1	100.00	10.00	110.00	$10.00	$100.00	$10.00	$110.00
2	100.00	16.00	116.00	6.00	50.00	8.00	58.00
3	100.00	21.00					
4		26.00					
5		30.00					
6		36.00					
7		45.50					
8		56.00					
9		72.00					
10		90.00					
11	100.00	109.00					
12	100.00	130.00					
13	100.00	160.00					

3. Graph FC, VC and TC on Figure 27.4. Label each curve. Then answer the questions.

(A) What is the difference between fixed and total costs?

(B) Why does VC rise as output increases?

(C) Why is FC a horizontal line?

(D) Why does the TC curve have the same slope as the VC curve?

Figure 27.4
Total Fixed Costs, Total Variable Costs and Total Costs

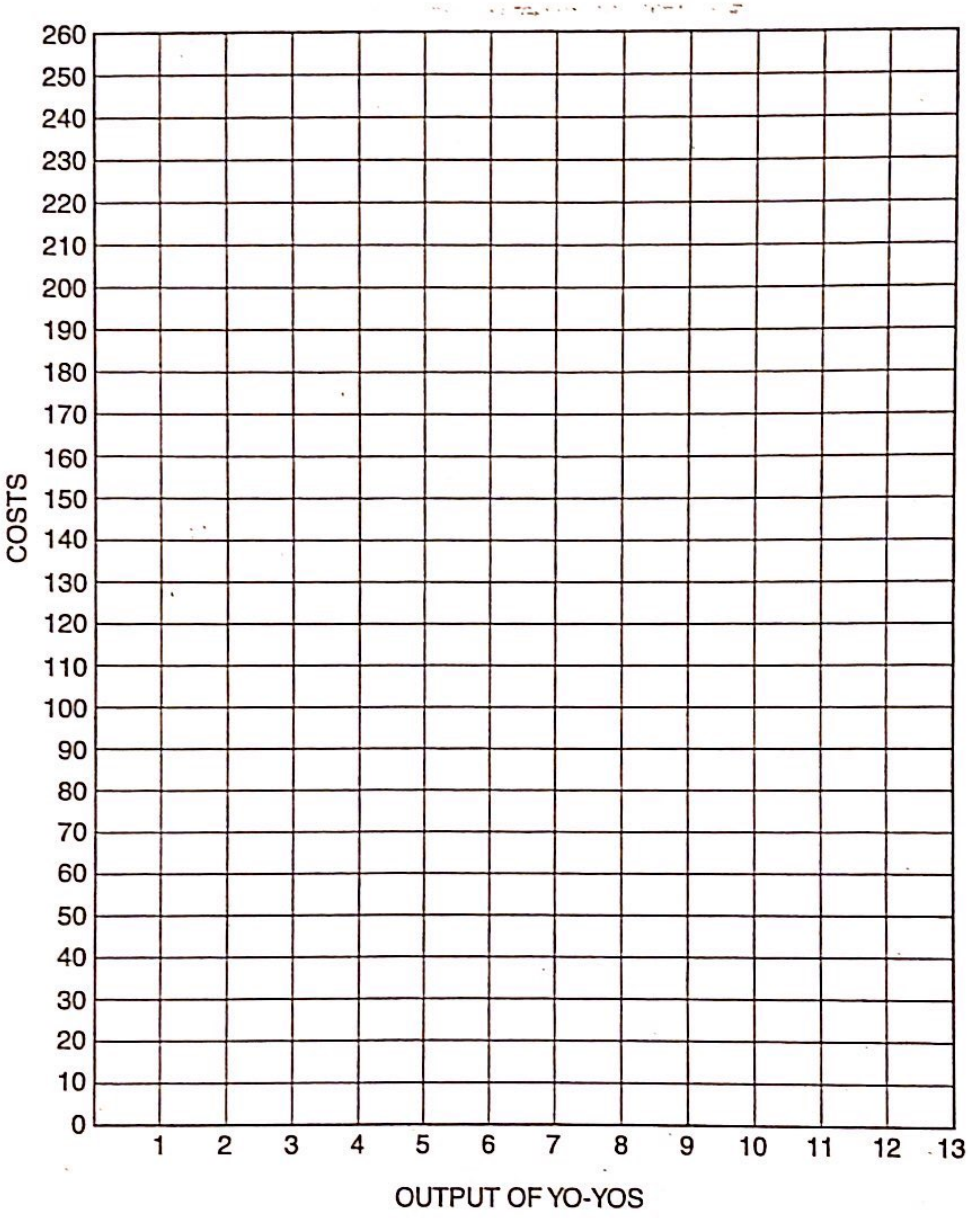
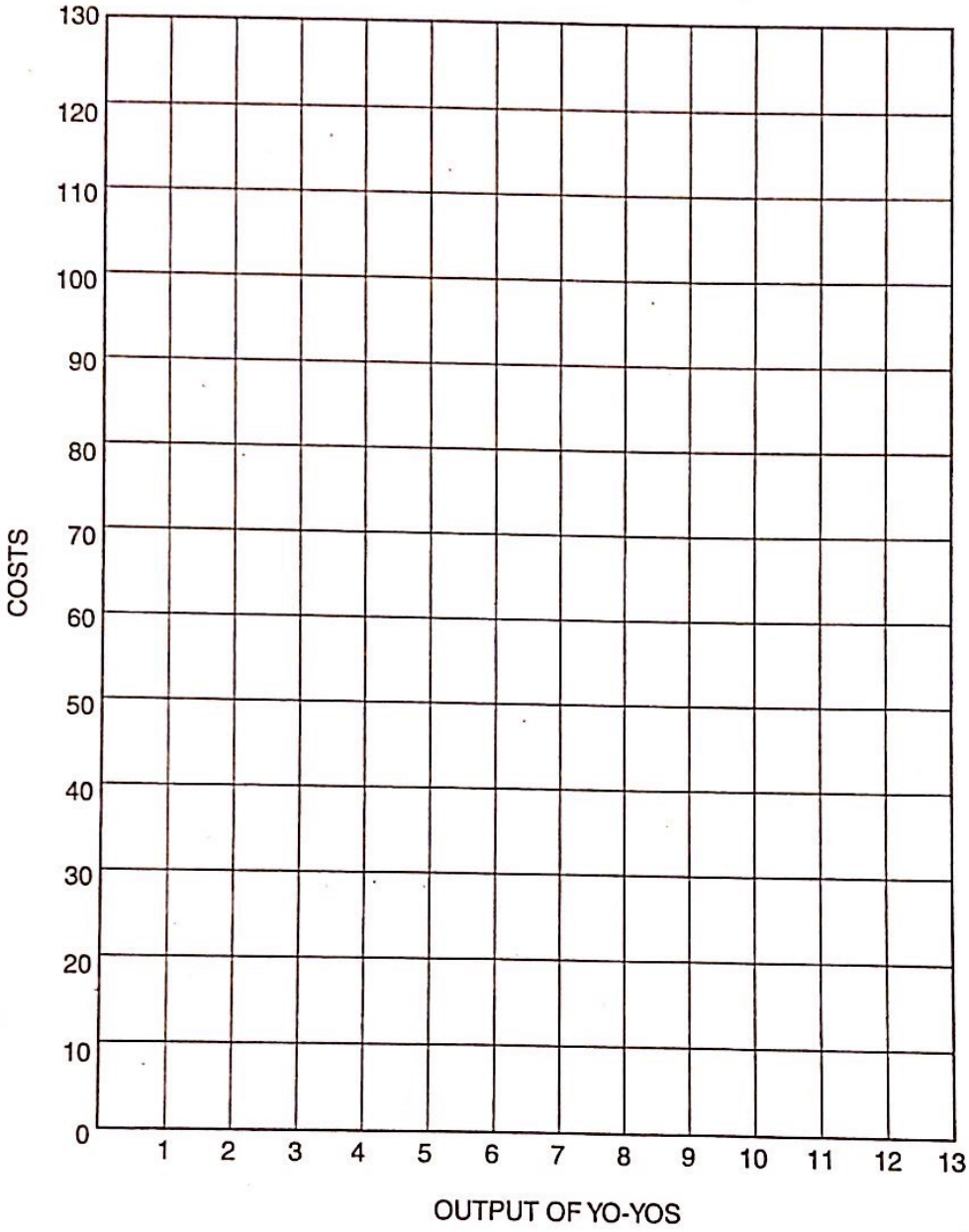


Figure 27.5

Average Variable, Average Fixed, Average Total and Marginal Costs



4. Graph AFC, AVC, ATC and MC on Figure 27.5 (be sure to plot MC on the midpoints of output). Label each cost curve. Then answer the questions.

   (A) What happens to AFC as output rises? Why?

(B) What happens to AVC as output rises? Why?

(C) What happens to ATC as output rises? Why?

(D) What happens to MC as output rises? Why?

(E) At what unique point does marginal cost cross AVC and ATC? Why?

(F) Why is MC the same whether computed from TC or VC?

Part C

For firms operating under perfect competition define the following terms.

5. Total revenue (TR)

6. Marginal revenue (MR)

7. Average revenue (AR)

Part D

Figure 27.6 is a revenue schedule for a perfectly competitive firm. Fill in the blanks.

Figure 27.6

Revenue Schedule for a Perfectly Competitive Firm

Price	Quantity	TR	MR
$10	1	$10	
10	2	20	$10
10	3	30	
10	4		

8. What generalization can you make about price and marginal revenue under perfect competition?

9. Why doesn't the perfect competitor lower the price to sell more?

10. What determines the price at which the perfect competitor sells the product?

Part E

11. Graph prices of $5.00, $10.50 and $21.50 on Figure 27.5. (Hint: Each price is a horizontal line.)

12. At a price of $21.50:

(A) How many yo-yos will the firm produce in the short run? Why? (Note: Assume you can produce part of a yo-yo.)

(B) Will the firm earn an economic profit or have an economic loss?

(C) How much will the approximate profit or loss be per unit?

(D) How much will the approximate total profit or loss be?

13. At a price of $10.50:

    (A) How many yo-yos will the firm produce in the short run? Why?

    (B) Will the firm earn an economic profit or have an economic loss?

    (C) How much will the approximate profit or loss be per unit?

    (D) How much will the approximate total profit or loss be?

    (E) Will this yo-yo firm stay open or shut down in the short run? Why?

14. At a price of $5.00:

    (A) How many yo-yos will this firm produce in the short run? Why?

    (B) Will this firm stay open or shut down in the short run? Why?

15. Why will a firm maximize its profits or minimize its losses at the output where MR (price) equals MC?

16. Why are price and MR the same for a perfect competitor?

17. Why is a perfect competitor called a *price taker*?

Costs and Competitive Market Supply (Perfect Competition)

Part A

1. The Fiasco Company is a perfectly competitive firm whose daily costs of production (including a "normal" rate of profit) in the short run are as follows:

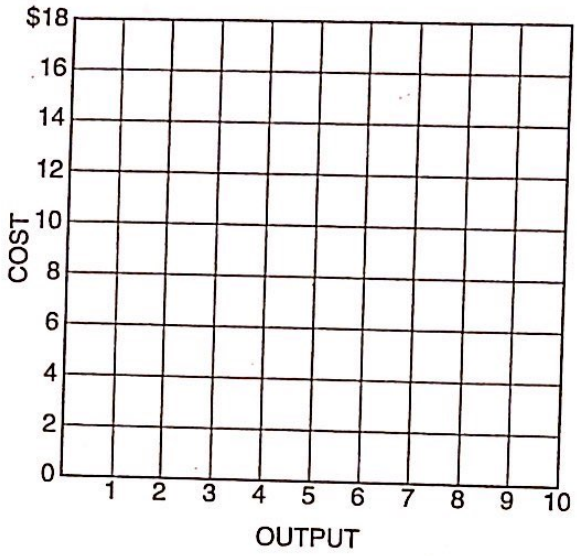
Figure 28.1
The Fiasco Company's Cost Table

Output (per day)	Total Variable Cost	Total Cost	Marginal Cost	Average Total Cost	Average Variable Cost
0	$0	$12.00			
1	4.00	16.00	$4.00	$16.00	$4.00
2	7.00	19.00	3.00	9.50	3.50
3	9.00	21.00		7.00	3.00
4	12.00	24.00			
5	18.00				
6	27.00				
7	37.00				
8	49.00				
9	63.00				
10	79.00				

(A) Fill in the blanks in Figure 28.1.

(B) On Figure 28.2, plot and label the average variable cost (AVC), average total cost (ATC) and marginal cost (MC) curves. Plot marginal cost at the midpoint. Assume this firm can produce any fraction of output per day so that you connect the points to form continuous curves.

Figure 28.2
The Fiasco Company's Cost Curves



(C) How would you interpret the vertical distance between the average total cost and average variable cost curves?

(D) Why does average total cost decline at first, then start rising as output is increased?

(E) The marginal cost curve intersects both average cost curves (ATC and AVC) at their minimum points. Why?

(F) If fixed costs were $20 instead of $12, how would the change affect average variable costs and marginal costs?

2. Given the cost curves for Fiasco Company on Figure 28.2 and the fact that the competitive market price at which the company must sell its output is $11 a unit, fill in the blanks below and add to your graph in Figure 28.2. (Remember, fractions of units are allowed.)

(A) Draw and label the average and marginal revenue curves on your graph.

(B) In order to maximize profits, Fiasco would sell ____ units, at a price of _____. Its average total cost would be _____. Its average revenue would be _____. It would earn a per-unit profit of _____ and total profit of _____ per day.

(C) If the firm produced instead at the quantity that minimized its average total cost, it could sell _____ units, at a price of _____. Its average total cost would be _____. If the market price were $11, its average revenue would be _____. It would earn a per-unit profit of _____ and total profit of _____ per day.

(D) If the competitive market price fell to $5 a unit, Fiasco would sell ____ units. Average total cost would be _____. It would earn a per-unit *(profit / loss)* of _____ and a total *(profit / loss)* of _____ per day.

Part B

3. The long-run cost conditions, including a "normal" rate of profit, for a perfectly competitive firm are as follows:

Figure 28.3
A Perfectly Competitive Firm Earning a "Normal" Rate of Profit

Output	Total Cost	Marginal Cost	Average Total Cost
1	$9.00		$9.00
2	13.00	$4.00	6.50
3	18.00	5.00	
4	24.00	6.00	
5	31.00		6.20
6	39.00		
7	48.00		6.86
8	58.00		
9	69.00		7.67
10	81.00		8.10

(A) Fill in the blanks in the average total cost and marginal cost columns.

(B) The level of output at which average total cost is at a minimum is _____ units. At this output, average total cost is $_____.

(C) What quantities would the firm be willing to supply at each of the following prices for its product?

Figure 28.4
Price and Quantity Supplied

Price	Quantity Supplied
$6	4
7	5
8	
9	
10	
11	
12	

(D) In general, the supply schedule (curve) of a perfectly competitive firm coincides with its _____ schedule (curve) in the range where _____ is greater than _____.

4. Suppose the perfectly competitive firm in Question 3 is one of 1,000 identical firms currently operating in a competitive industry, all of which have identical cost functions. The market demand for this industry is given in Figure 28.5

Figure 28.5
Market Demand for an Industry

Price	Quantity Demanded	Quantity Supplied
$12	2,000	10,000
11	3,000	9,000
10	4,000	
9	5,000	
8	6,000	
7	7,000	
6	8,000	

(A) Fill in the industry supply schedule in Figure 28.5. Then answer the following questions by filling in the answer blanks, underlining the correct words in parentheses or writing a sentence.

(B) Explain briefly how the short-run supply schedule (curve) of a competitive industry is derived.

(C) Given the present 1,000 firms in the industry, the present market price is _____; the present equilibrium quantity is _____ units. At this price, each firm will be making *(positive economic profit / zero economic profit / negative economic profit / economic losses).*

(D) Given the equilibrium above, and assuming that other firms can enter the industry with the same cost as the present firms, the number of firms in the industry in the long run will tend to *(increase / decrease/ remain constant)* and the price will tend to *(increase / decrease / remain constant)*. The output of the industry will tend to *(increase / decrease / remain constant)*, while output per firm will *(increase / decrease/ remain constant).*

(E) If this is a constant-cost industry (i.e., costs per unit of output are constant as the industry expands), the long-run equilibrium price for the industry will be _____; output per firm will be _____ units. There will be _____ firms in the industry, each earning _____ economic profits; industry output will be _____ units. The equilibrium price coincides with the _____ per-unit cost of production.

(F) Can you see why, under the conditions described above, that the long-run market-supply curve for this industry would appear as a horizontal line on a graph? Explain.

(G) Using the cost curves in Figure 28.2, at what price would this long-run horizontal line be plotted? _____ Explain why it would be at this price.