

1. Voda Reservoir is a profit-maximizing firm and the only producer of bottled water in a country. Currently, Voda Reservoir is earning negative economic profit.
- A. Draw a correctly labeled graph for Voda Reservoir and show each of the following.
- The profit-maximizing quantity, labeled  $Q_M$
  - The profit-maximizing price, labeled  $P_M$
  - The average total cost curve consistent with Voda Reservoir earning negative economic profit, labeled ATC
  - The area of deadweight loss, shaded completely
- B. Suppose the government requires Voda Reservoir to produce the socially optimal quantity of bottled water. On your graph in part A, show the socially optimal quantity of bottled water, labeled  $Q_S$ .
- C. Suppose instead the government grants a per-unit subsidy to Voda Reservoir. What will happen to Voda Reservoir's profit-maximizing quantity of bottled water? Explain.
- D. Suppose new producers have entered the bottled-water market and Voda Reservoir continues to operate in the bottled-water market. Will the demand for Voda Reservoir's bottled water become more elastic, become less elastic, or stay the same as new producers enter the market?
- E. Voda Reservoir hires workers in a perfectly competitive labor market.
- If the demand for bottled water increases, what will happen to Voda Reservoir's demand for labor? Explain.
  - The government implements a new regulation that increases the minimum age required for a worker to be employed in a bottled-water factory. What will happen to the market wage in the short run? Explain.

1. Arzeeye Pharma has a patent, a legal barrier to entry, on its newly developed eye treatment that cures common eye problems. Arzeeye Pharma is currently earning positive economic profit and is producing the profit-maximizing quantity of eye treatments.
- (a) Draw a correctly labeled graph for Arzeeye Pharma and show each of the following.
- The profit-maximizing quantity of eye treatments, labeled  $Q^*$
  - The profit-maximizing price, labeled  $P^*$
  - The average total cost curve consistent with positive economic profit, labeled ATC
  - The area representing consumer surplus, shaded completely
- (b) Suppose Arzeeye Pharma wants to charge a price that maximizes its total revenue rather than its profit.
- On your graph in part (a), show the revenue-maximizing quantity, labeled  $Q_R$ .
  - At quantity  $Q_R$  identified in part (b)(i), is the demand for eye treatments elastic, inelastic, or unit elastic?
- (c) Suppose now that Arzeeye Pharma engages in perfect price discrimination.
- On your graph in part (a), show the lowest price that Arzeeye Pharma would charge, labeled  $P_2$ .
  - What would happen to consumer surplus? Explain.
- (d) Suppose instead that Arzeeye Pharma's patent expires. Will the demand for Arzeeye Pharma's treatment become more elastic, become less elastic, or not change? Explain.

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