4. Consider the choices facing an unprofitable (and perfectly competitive) firm. The firm currently produces 100 units per day at a price of $22. The firm's total cost is $3,000 per day, and its variable cost is $2,500 per day. At the current output level, the marginal cost of production is $45.

    a.   Evaluate the following statement from the firm's accountant: "Given our current production level, our variable cost ($2,500) exceeds our total revenue ($2,200). We should shut down our production facility. Illustrate your answer with a graph showing the standard short-run cost curves and the revenue curve of a perfectly competitive firm.

> **The marginal cost ($45) exceeds the marginal revenue (price=$22), so the firm is not maximizing its profit: the firm is producing too much output. At the profit-maximizing output, the total revenue may exceed variable cost. We cannot decide whether the firm should be shut down until we know the average variable cost at the profit-maximizing quantity. However, if TR < VC at the profit-maximizing point, the accountant is correct, and the firm should shut down.**

    b. Illustrate your answer with a graph showing short-run cost curves and the revenue curve of a perfectly competitive firm.

> **The marginal revenue curve is horizontal at a price of $22. Marginal revenue must equal marginal cost at an output of less than 100 units. At 100 units, SATC and SAVC exceed $22, but both will be lower at the appropriate level of output.**

5. Consider the following from a wheat farmer to his workers: "The price of wheat is very low this year, and the most I can get from the crop is $35,000. If I paid you the same amount as I paid you last year ($30,000), I'd lose money, because I also have to worry about the $20,000 I paid three months ago for seed and fertilizer. I'd be crazy to pay a total of $50,000 to harvest a crop I can sell for only $35,000. If you are willing to work for half as much as last year ($15,000), my total cost will be $35,000, so I'll break even. If you don't take a pay cut, I won't harvest the wheat." Is the farmer bluffing, or will the farm workers lose their jobs if they reject the proposed pay cut?

> **The farmer is bluffing. The revenue from the wheat will still cover the farmer's variable cost (hiring the workers). The $20,000 is a fixed (and sunk) cost, and thus cannot be recovered. The farmer will lose less by paying his workers the usual amount (loss of $15,000) than he would be not harvesting the crop (loss of $20,000).**

7. Consider the following data on the relationship between the price of gasoline (in real terms, adjusted for inflation) and the quantity of gasoline sold per day in the City of Ceteris Paribus.

Year	Price	Gallons per Day
1995	1.00	50,000
1996	1.10	53,000

If possible, draw the industry supply curve and compute the price elasticity of supply.

> **We can only use this information to draw the supply curve and compute the price elasticity of supply if we know that all determinants of supply, such as production costs and number of firms, were held constant over this time period.**

8. Between 1980 and 1990, the percentage of U.S. households with videocassette recorders (VCRs) increased from 1% to 70%. The rapid growth in the number of VCRs increased the demand for video rentals. Predict the effect of this increase in demand on the price of video rentals in the short run and the long run.

In the short run, the price will increase greatly. In the long run, as more firms enter the market, the price will decrease relative to the short-run price. How much the price falls depends on whether this is a constant-cost or an increasing-cost industry.