1. See graph for curves. This answer will depend on how you define your fixed costs for the firm. If your fixed costs are sunk, then it is best in the short run to produce. The price exceeds the average variable cost so you are covering your variable costs and starting to cover some of your fixed costs (profit from producing where MR=MC is greater than profit at Q=0). If you can recover your fixed costs, then you should choose to produce zero to maximize profits (your profits from zero production are zero and the profits from producing where marginal revenue equals marginal cost is less than zero). Thus, you should have mentioned what you assumed about fixed cost and how that affects the profit maximizing decision.

- **Sunk Fixed Cost**
  \[ q = q^* \]
  \[ \rho > \text{AUC} \]
  \[ \rightarrow \text{Profit}(q^*) > -\text{FC} \]

- **Can Recover Fixed Cost**
  \[ q = 0 \]
  \[ \rho < \text{ATC} \]
  \[ \text{Profit}(q=0) = 0 \]
  \[ \text{Profit}(q=q^*) < 0 \]
2. The first approach explains why the marginal cost of the final unit produced equals the marginal benefit of the final unit consumed. The firm analysis is that the firm produces a quantity where marginal revenue equals marginal cost. Given that marginal revenue is the market price (in perfect competition), the firms produce at a point where marginal cost equals price. When consumers maximize utility, they consume until marginal benefit (marginal utility) equals marginal cost. The marginal cost when examining a single good is the market price. Thus the consumers purchase the item until marginal utility equals price. Given the consumers and the producers use the market price in their maximization problems, the marginal cost of production of the last good equals the marginal utility. The total surplus analysis is easiest using a graph like the one listed below. \(Q^*\) is the surplus maximizing quantity. Our analysis limits us to arguments of efficiency and total surplus. What is best could depend on distributional concerns and/or the presence of externalities. Just because a market is efficient (using our definition of efficiency) does not mean that is satisfies what is "best" for society.

3. No, a monopolist has a downward sloping demand (the market demand curve). Thus, the total revenue changes depending on the quantity produced and consumed. The marginal revenue curve falls twice as fast as the demand curve. When a monopolist chooses the profit maximizing quantity, it sets marginal revenue equal to marginal cost. At the quantity, the monopolist charges the highest price consumers are willing to pay (whatever the price is at the quantity demanded). Given the demand curve is not equal to the marginal revenue, marginal revenue will not be equal to price (or the monopolist has pricing power).
4. See graph for cost curves and profit maximizing choice. The monopolist chooses the profit maximizing quantity by applying the marginal principle. This is done by setting marginal revenue equal to marginal cost. Given the firm is earning positive economic profits, there is an incentive to enter the market. However, as long as the barriers to entry stay in place, there will be no entry.

5. See the graph. A monopoly market gives positive economic profits to the monopoly. These profits serve as an incentive for firms to be innovative and be the only producers of a product. This graph is a static, one period illustration of welfare for society. It does not account for the effects of innovation in a society. A society might prefer to have a monopoly market because it gives firms additional money to use for research and development and the economic profits provide an incentive for other firms to be innovative.