

Price Elasticity of Demand and Total Revenue:

Price elasticity of demand (PED) measures the responsiveness of quantity demanded to a change in price. It is calculated as the percentage change in quantity demanded divided by the percentage change in price.

- Elastic Demand ($|PED| > 1$): When demand is elastic ($|PED| > 1$), it means that the percentage change in quantity demanded is greater than the percentage change in price. In other words, consumers are very responsive to price changes. If the price increases, the quantity demanded will decrease by a greater percentage.
- Inelastic Demand ($|PED| < 1$): When demand is inelastic ($|PED| < 1$), it means that the percentage change in quantity demanded is less than the percentage change in price. Consumers are not very responsive to price changes. If the price increases, the quantity demanded will decrease by a smaller percentage.
- Unitary Elastic Demand ($|PED| = 1$): When demand is unitary elastic ($|PED| = 1$), the percentage change in quantity demanded is exactly equal to the percentage change in price.

Total Revenue:

Total revenue is calculated as the price of the good multiplied by the quantity sold. Mathematically,

$$\text{Total Revenue} = \text{Price} \times \text{Quantity Sold}$$

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Relationship between Price Elasticity of Demand and Total Revenue:

- Elastic Demand: When the price of an elastic good increases (and demand is elastic), the decrease in quantity demanded by consumers will be proportionately greater than the increase in price. As a result, the total revenue (price multiplied by quantity) will decrease.
- Inelastic Demand: When the price of an inelastic good increases (and demand is inelastic), the decrease in quantity demanded by consumers will be

proportionately smaller than the increase in price. In this case, total revenue will increase.

- Unitary Elastic Demand: When demand is unitary elastic, a change in price will result in no change in total revenue.

Applying to the Given Scenario:

In the given scenario, the price elasticity of demand is 2, indicating that demand is elastic. If the price of the goods increases, the decrease in quantity demanded will be greater than the increase in price. As a result, the total revenue (price multiplied by quantity) will decrease. This is because the increase in price is not enough to offset the larger decrease in quantity demanded due to the higher price.

In summary, when the price elasticity of demand is 2 and the price of the goods increases, total revenue will decrease due to the elastic nature of demand, where consumers are highly responsive to price changes.