1. **THE PRICE ELASTICITY OF DEMAND** \( (E^D_p) \) tells us by how much quantity demanded will change for a given change in price.

\[
E^D_p = \frac{\%\Delta Q^D}{\%\Delta P}
\]

The law of demand tells us that \( \uparrow P \Rightarrow \downarrow Q^D \) and \( \downarrow P \Rightarrow \uparrow Q^D \) so it must be the case that \( E^D_p \) is always < 0 (negative).

2. If the income elasticity of demand is positive, the good must be a normal good, because an increase in income (positive denominator) will cause an increase in demand (positive numerator) and a decrease in income (negative denominator) will cause a decrease in demand (negative numerator). If the income elasticity of demand is negative then the good must be an inferior good, because an increase in income will cause a decrease in demand, and a decrease in income will cause an increase in demand.

3. **USE THE MIDPOINT FORMULA FOR THIS QUESTION.**

(a) Between A and B: \( \% \text{chg} \ q = 18.18 \) and \( \% \text{chg} \ p = 9.52 \)  \( \Rightarrow \) elasticity = - 1.91 = elastic

so, an increase in \( p \) will cause a decrease in revenue

(b) Between C and D: \( \% \text{chg} \ q = 8.696 \) and \( \% \text{chg} \ p = 66.70 \)  \( \Rightarrow \) elasticity = - 0.13 = inelastic

(c) higher price forces consumers to look for or accept more substitutes, so they will be more sensitive to price changes at higher prices. This means more elastic demand at higher prices.

4. **DETERMINANTS OF PRICE ELASTICITY OF DEMAND:**

(1) Availability of substitutes.

\( \uparrow \# \text{of substitutes} \Rightarrow \uparrow \text{elasticity (more flexible)} \Rightarrow Q^D \text{ will change a lot for a given change in price.} \)

(2) Time.

\( \text{Short run} \rightarrow \text{demand is likely to be less flexible (inelastic), you might not change what you buy immediately if prices change.} \)

\( \text{Long run} \rightarrow \text{demand is likely to be more flexible (elastic).} \)

(3) The fraction of our budget that the good uses

\( \text{For goods that make up only an insignificant portion of our budget (goods that we don't buy very often or that have a very low price) - we might not react that much to a price change. So, goods that make up a very small portion of our budget} \Rightarrow \text{inelastic demand} \Rightarrow \text{only small (if any) change in } Q^D \text{ for a given change in price.} \)

\( \text{Goods that make up a large portion of our budget} \Rightarrow \text{elastic demand} \Rightarrow \text{only large change in } Q^D \text{ for a given change in price. Because it is purchased so much, or because it has such a high price, we'll be more aware of that good and look for substitutes.} \)

<table>
<thead>
<tr>
<th>Many substitutes</th>
<th>Few substitutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much time</td>
<td>Short time</td>
</tr>
<tr>
<td>Large portion of budget</td>
<td>Small portion of budget</td>
</tr>
</tbody>
</table>

5. (a) elastic because price elasticity is > 1 in abs value (b) normal because income elasticity is > 0 (c) substitutes because cross price elasticity is > 0


11. TRUE 12. FALSE 13. FALSE