Monopoly

- Profits, \( \pi(q) = TR(q) - TC(q) \)

- Effect of Higher output on \( \pi \)
  \[
  \frac{\Delta \pi}{\Delta q} = \frac{\Delta TR}{\Delta q} - \frac{\Delta TC}{\Delta q} = MR(q) - MC(q)
  \]

- \( \pi \) - Maximization – in general
  \[
  \frac{\Delta \pi}{\Delta q} = MR(q) - MC(q) = 0
  \]
  or \( MR(q) = MC(q) \)

- Under Competition, \( MR(q) = P \)

- Under Monopoly:

- Total Revenue \( TR(Q) = P(Q)Q \)

- Marginal Revenue
  \[
  MR(Q) = \frac{\Delta TR}{\Delta Q} = P + Q \frac{\Delta P}{\Delta Q}
  \]

  \[
  MR(Q) = P + P \frac{Q \Delta P}{P \Delta Q}
  \]

  \[
  MR(Q) = P + \frac{P}{\varepsilon_D}
  \]