## Mathematics in Economics – lecture 4

1) Extreme of function

**The second derivative may be used to determine local extrema of a function under certain conditions**. If a function has a critical point for which $f'(x) = 0$ and

   A) the second derivative is positive at this point, then $f$ has a local minimum here.
   B) the second derivative is negative at this point, then $f$ has a local maximum here.

$$f(x) = x^2 - 8x + 4$$

$$f(x) = -2x^2 + 12x$$

$$f(x) = x^3 + 3x^2 + 1$$

Find the maximum of total revenue function

$$TR(Q) = -1400 + 80Q - Q^2$$

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Find the minimum of total cost function:

$$TC(Q) = 100 - 60Q + Q^2$$

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Find the maximum of the profit function:

$$PR(Q) = 100 + 64Q - 4Q^2$$

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Find the maximum of total revenue function:

$$TR(Q) = -80Q^2 + 160Q + 200$$

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