



Optimisation-Maximisation

Topic	Interpretation
$\Pi = TR - TC$ --(1)	Π : The profit TR : total Revenue from producing q units . TC : total Cost to produce q units.
TR = q x p --(2)	p : Price per unit .
(1) & (2): $\Pi = qxp - TC$	The best value of q is that which maximizes the profit.
$f'(x) > 0$	$f(x)$ is increasing
$f'(x) < 0$	$f(x)$ is decreasing
$f'(x) = 0$ Example : $F(x) = x^2 - 4x + 1$	$f(x)$ admits a critical point or a stationary point. Which is either Maximum or Minimum. $F'(x) = 2x - 4$,to get the points of Max or Min.,set $F'(x) = 0$ $2x - 4 = 0$, $x = 2$
$F'(a)=0$ and $F''(a) < 0$ $F'(a)=0$ and $F''(a) > 0$ $F'(a) = 0$ and $F''(a) = 0$ Example : $F(x) = x^3 - 12x^2 + 21x + 100$	The point a is a maximum of F The point a is a minimum of F The point a may be a max.,a min or an inflection point. $F'(x) = 3x^2 - 24x + 21 = 0$ $3(x-1)(x-7) = 0$ $x = 1$ or $x = 7$,we need $F''(x)$ test to determine their nature: $F''(x) = 6x - 24$ $F''(1) = -18 < 0$; 1 Maximizes F $F''(7) = 18 > 0$; Minimizes F