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Maxima&Minima Handout #14

Optimisation-Maximisation

Topic	Interpretation
$f'(x) > 0$	$f(x)$ 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