SIKSHAPATH
WE ARE LIMITLESS

HOW TO FIND MAXIMA AND MINIMA

1) Given f(x), we differentiate once to find f '(x).

2) Set f '(x)=0 and solve for x. Using our above observation, the x values we find are the 'x-coordinates' of our maxima and minima.

3) Substitute these x-values back into f(x). This gives the corresponding 'y-coordinates' of our maxima and minima.

Which of these points are maxima and which are minima?

Here we may apply a simple test. Assume we've found a stationary point (a,b):

1. Differentiate f '(x) once more to give f ''(x), the *second derivative*.

2) Calculate f ''(a).

If f ''(a)<0 then (a,b) is a local maximum.

If f ''(a)>0 then (a,b) is a local minimum.

Q//Find the stationary point of the function

$y=x^2-2x+3$

sol:

If $y=x^2-2x+3$ then

$dy/dx= 2x-2$

and Now

$d^2y/dx^2 = 2 > 0$

Now,

$dy/dx = 2x-2 = 0$

so,

$2x-2=0$

$x=1$

The function has only one stationary point when $x = 1$ (and $y = 2$).

Since $d^2y/dx^2 = 2 > 0$ for all values of x, this stationary point is a local minimum.

Thus the function $y = x^2 - 2x + 3$ has a local minimum at the point (1,2).

SOLVE SAME PROBLEM USING ONLINE CALCULATOR:

https://www.emathhelp.net/en/calculators/calculus-1/critical-points-extrema-calculator/?f=x%5E2-2x%2B3&i=