Extreme points $y^I = 0$

Given the function

$y = \frac{x^2-3}{x-2}$ $x \neq 2$

$y^I = \frac{2x(x-2)-(x^2-3)}{(x-2)^2} = \frac{x^2-4x+3}{(x-2)^2}$

Extreme points $y^I = 0$

$x^2 - 4x + 3 = 0$

$(x - 2)^2 - 4 + 3 = 0$

$(x - 2)^2 = 1$

$x - 2 = -1$ $x - 2 = 1$

$x = 1$ $x = 3$

x	(2) x=1	x=3
v^I	++++0	---I---0++++
y	↗	↘ ↘ ↗
	Max	Min
	(1,2)	(3,6)

We want to prove that

When given $x < 2$ $(x - 2 < 0)$

$y = \frac{x^2-3}{x-2} \leq 2$ /. $(x - 2)$

$x^2 - 3 \geq 2(x - 2)$

$x^2 - 2x + 1 \geq 0$

$(x - 1)^2 \geq 0$