Algebra proof y ≤ - 4

Given $y = x - 2 + \frac{1}{x} = \frac{x^2-2x+1}{x}$ $x \neq 0$

If $x < 0 \Rightarrow y \leq -4$

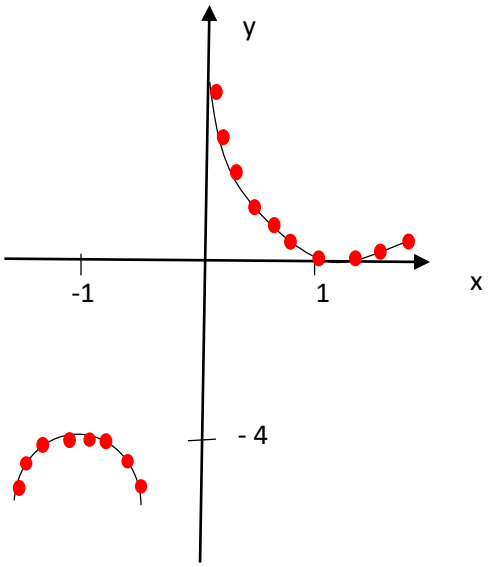
$\frac{x^2-2x+1}{x} \leq -4$ (x<0)

$x^2 - 2x + 1 \geq -4x$

$x^2 + 4x - 2x + 1 \geq 0$

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

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



$y = x - 2 + \frac{1}{x}$ $(x \neq 0)$

$y^I = 1 - \frac{1}{x^2} = 0$ (extreme points)

$1 = \frac{1}{x^2} \Rightarrow x^2 = 1$

x = -1 x = 1

(-1,-4) (1,0)

X	-1	1
Y^I	++++++++++ 0----------	---------- 0+++++
	Max	Min