Min and Max , drawing Y

Y = $\frac{ax-b}{x^2+1}$

When x = - 1 we have Min

Given a + b = 4 , draw Y

$y^I = \frac{a.(x^2+1)-2x(ax-b)}{(x^2+1)^2} =$

$= \frac{-ax^2+2bx+a}{(x^2+1)^2}$

$y^I(x= -1) = 0 \quad \Rightarrow$ - a – 2b + a = 0

- 2b = 0

b = 0

a + b = 4 $\Rightarrow$ a = 4

y = $\frac{4x}{x^2+1}$

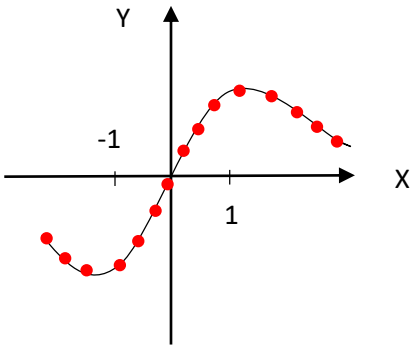
$y^I = \frac{4(x^2+1)-8x^2}{(x^2+1)^2} = 0$

- $4x^2$ + 4 = 0

x^2 = 1

x = -1 , x = 1

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



y ≤ 2 for all X

$\frac{4x}{x^2+1} \leq 2$, $\frac{2x}{x^2+1} \leq 1$

$2x \leq x^2 + 1$

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

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