Max – Min

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

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

$y^{I} = \frac{(x+1)[x+1-2(x-4)]}{(x+1)^4} = \frac{(x+1)(-x+9)}{(x+1)^4} = 0$

$x = 9$

$y = \frac{5}{100} = \frac{1}{20}$

x	x= - 1	X = 9
y^{I}	----------	+++++0 --------
y	↘	↗ Max ↘

Max (9 , ?)

Max $(9, \frac{1}{20})$

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

when x > 4 , y > 0

When x < 4 , y < 0

Prove that

$\frac{x-4}{(x+1)^2} \leq \frac{1}{20}$

$20(x-4) \leq (x+1)^2$

$(x+1)^2 \geq 20x - 80$

$x^2 + 2x + 1 \geq 20 - 80$

$x^2 - 18x + 81 \geq 0$, $a^2 - 2ab + b^2 = (a-b)^2$

$(x - 9)^2 \geq 0$

$(9, \frac{1}{20})$ Max