FIND THE ~~MAXIMUM~~ UPPER BOUND FOR THE MAX ERROR ALONG ALL POINTS OF $P_n(x)$

w/ THE INFINITY NORM OF ANY FUNCTION f SUBTRACTED BY A POLYNOMIAL OF 3RD DEGREE ... THIS POLY MUST BE $P_n(x)$

$f(x)$ FOR OUR SPECIAL CASE

$f(x) = e^x$

& $P_3(x) = P_{3_L}(x) = 0.8455x^3 - 1.060x^2 + 1.937x + 1$

$$\max_{0 \le x \le 3} \left| e^x - (0.8455x^3 - 1.060x^2 + 1.937x + 1) \right|$$

SO,

$x = 0 \rightarrow ?$

$x = 3 \rightarrow ?$

$$\left| e^3 - (0.8455(3)^3 - 1.060(3)^2 + \cdots + 1.937(3) + 1) \right|$$

$$= |20.09 - 20.09|$$

$$\| f - P_n(x) \|_\infty = \max_{0 \le x \le 3} | f(x) - P_3(x) | = \emptyset$$