ACT
MAA4212 3009

Class-G

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fACTogenarians. Please write **DNE** in a blank <u>if</u> the described object does not exist or if the indicated operation cannot be performed.

G5: *Show no work.*

z In $\mathbb{R}$: $[1+\boldsymbol{i}]^{86} = [\ \ldots\ ] + \boldsymbol{i}\cdot[\ \ldots\ ]$.

[*Hint: Multiplying complexes multiplies their modulii, and adds their angles. You may use* sin *and* cos *if you wish.*]

a Let $h := [y \mapsto \cos(2y)]$. Then the 5-topped poly $\mathbf{T}^h_{5,0}(x) =$ ________________.

b Poly $\beta(x) := x^{11} + x^{87}$ has 9^{th} derivative,
$\beta^{(9)}(x) =$ ________________. (Coeffs ITOf prods and quotients of factorials.)

<u>Our</u> integral-formula of the 9^{th} Remainder-term, centered at 3, evaluated at 5, is

$$\mathbf{R}^{\beta}_{9,3}(5) = \int_{\ldots}^{\ldots} \underline{\hspace{3cm}} \cdot \mathrm{d}t.$$

c Let $J := [0,2]$. Define a fnc $g \in \mathbb{RI}(J \to J)$ for which $g \circ g \notin \mathbb{RI}$. E.g,
$g :=$ ________________,
with $\operatorname{DisCty}(g) =$ ________________.
Composing,
$g \circ g =$ ________________.
So $\operatorname{DisCty}(g \circ g) =$ ________________.

d $K := (4,7]$ is a $\mathcal{G}_\delta$-set because K can be written ________________. And K is $\mathcal{F}_\sigma$ since $K =$ ________________

Mini-essay. Please double-space on your own paper.

G6: Set $J := [4,7]$. *Recall:* Thm A. *Fnc* $f\colon J \to \mathbb{R}$ is $\mathbb{RI}$ IFF $\forall \varepsilon$, $\exists$ a partition P such that $\operatorname{Osc}^f(\mathsf{P}) \leqslant \varepsilon$.

Use Thm A to prove: Thm B. *Suppose* $f\colon J \to \mathbb{R}$ *is strictly-increasing. Then* f *is* $\mathbb{RI}$.

End of Class-G