

Essay question: Carefully write a triple-spaced essay solving the problem. Start each essay on a new sheet of paper.

Hello. Please write **DNE** in a blank if the described object does not exist or if the indicated operation cannot be performed.

G1: Show no work.

a In \mathbb{R} , the “punctured interval” $S := [3, 8] \setminus \{7\}$ is an \mathcal{F}_σ -set because we can write $S =$.

b Poly $\beta(x) := x^{19} + x^{86}$ has 5th derivative, $\beta^{(5)}(x) =$ (Coeffs ITOf prods and quotients of factorials.)

Our integral-formula of the 5th Remainder-term, centered at 7, evaluated at 3, is

$$\mathbf{R}_{5,7}^\beta(3) = \int_{\dots}^{\dots} \dots \cdot dt.$$

c Let $h := [y \mapsto 7 + \sin(2y)]$. Then the 5-topped poly $\mathbf{T}_{5,\pi}^h(x) =$.
[Hint: The center of expansion is π , not zero.]

d P.L fncs $f_n \xrightarrow[n \rightarrow \infty]{\text{ptwise}} \mathbf{0}$ have $[\int_0^5 f_n] = n^3$. The cutpoint and height tuples of f_n are

$$\vec{\mathbf{p}}_n := (0, \quad 5 - \frac{2}{n}, \quad \dots, 5)$$

$$\text{and } \vec{\mathbf{h}}_n := (0, \quad \dots, \dots, 0).$$

And $\|f_n\|_{\text{sup}} =$.

e On the ellipse $x^2 + [\frac{y}{2}]^2 = 1^2$, the max-point of $\Gamma(x, y) := x - y$ is (\dots, \dots) .

G2: Let $J := [0, 1]$ and $K := [3, 5]$. Suppose $g: K \rightarrow \mathbb{R}$ is Lipschitz cts, with Lipschitz-constant 7. Suppose $f \in \mathbf{RI}(J \rightarrow K)$. Let $h := g \circ f$. Prove that h is integrable. [Hint: Start with “PROOF: Fix $\varepsilon > 0$.” Perhaps define some other quantities. Now prove, given an arbitrary partition P , that $\text{Osc}^h(P) \leq \varepsilon$.]

G3: Carefully *state* the version of FTC from our NOTES. (Do not prove FTC.)

End of Class-G