Moda
MAA4227 MAA5229

Class-E

Prof. JLF King
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E4: Fill-in each blank, and circle the appropriate letter for **True/False** questions. Show no work.

a With $f(t) := \int_{\sin(t^3)}^{\exp(5t)} \cos\big(\sin(x)\big)\,dx$, then $f'(t)$ equals .

Simplified, $f'(0) =$.

[*Hint:* Chain rule and Fund. Thm of Calculus.]

b That 1/5 is a ***Lebesgue number*** of open-cover $\mathcal{C}$ of (X, d), means that .

Patches $\mathcal{C} := \big\{(-\infty, 28], [17, +\infty)\big\}$ cover $\mathbb{R}$. Thus MaxLebesgueNumber($\mathcal{C}$)= .

c Every compact MS is complete. T F

Suppose compact MS Y is a subspace of MS X. Then Y is automatically X-closed. T F

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

e P.L fncs g_n converge ptwise, but **not** uniformly, to $-Id$ where the cutpoint and height tuples of g_n are

$$\vec{\mathbf{p}} := (\,2,\ 3,\ \_\_\_\_\_,\ 5)$$

and $\vec{\mathbf{h}} := (-2, -3, \_\_\_\_\_, -5)$.

P.L fncs f_n converge ptwise, but **not** uniformly, to $x \mapsto 2x$ where the cutpoint and height tuples of f_n are

$\vec{\mathbf{p}} := (1, 2, 3, 4)$

and $\vec{\mathbf{h}} := (2, \_\_\_\_\_, \_\_\_\_\_, 8 + \frac{1}{n})$.

Essay question, triple-spaced:

E5: Let $\mathbf{J}$ be the interval $(2, 6)$. Suppose functions $H_n \xrightarrow{\text{uniformly}} f$, where $f, H_n : \mathbf{J} \to \mathbb{R}$. If each H_n is uniformly-cts, prove that f is **uniformly-cts**.

End of Class-E

E4:	___ ___ ___	100pts
Poorly stapled, or missing name or honor sig: **E5:**	___ ___	45pts
	___ ___	−10pts
Not triple-spaced:	___ ___	−15pts
Total:	___ ___ ___	145pts

Please PRINT your name and ordinal. Ta:

Ord:

HONOR CODE: *"I have neither requested nor received help on this exam other than from my professor."*

Signature: