Calc 2
MAC2312

Prereq-A

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A1: Show no work. *NOTE*: The **inverse-fnc** of g, often written as g^{-1}, is *different* from the **reciprocal fnc** $1/g$. E.g, suppose g is invertible with $g(-2) = 3$ and $g(3) = 8$: Then $g^{-1}(3) = -2$, yet $[1/g](3) \stackrel{\text{def}}{=\!=} 1/g(3) = 1/8$.

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

___ a Line $y = Mx + B$ is orthogonal to $y = \frac{1}{5}x + 2$ and owns $(4, 10)$. So $M=$ ⌞.....⌟ and $B=$ ⌞.....⌟.

___ b The solutions to $5x^2 = 3 - 2x$ are $x =$ ⌞.....⌟.

___ c $\left[\sqrt{3}^{\sqrt{2}}\right]^{\sqrt{8}}=$ ⌞.....⌟. $\log_8(4)=$ ⌞.....⌟.

___ d If $\log_B(64) = 3$ then $B=$ ⌞.....⌟.

___ e Let $y = f(x) := \left[2 + \sqrt[5]{x}\right]/3$. Its inverse-function is $f^{-1}(y)=$ ⌞.....⌟.

___ f Let $g(x) := x^3 + x$. Then $g^{-1}(10)=$ ⌞.....⌟ and $[g^{-1}]'(10)=$ ⌞.....⌟.

___ g $\frac{\mathrm{d}}{\mathrm{d}z}\left(\frac{\sin(2z)}{3+z^2}\right) = \frac{f(z)}{g(z)}$ where $f(z)=$ ⌞.....⌟ and $g(z)=$ ⌞.....⌟.

___ h For $x > 0$, let $B(x) := x^x$. Its derivative is $B'(x)=$ ⌞.....⌟.
[*Hint:* How is y^z, for $y > 0$, defined in terms of the exponential fnc?]

___ i Below, f and g are differentiable fncs with

$$\begin{array}{llll} f(2) = 3, & f(3) = 5, & f'(2) = 19, & f'(3) = 17, \\ g(2) = 11, & g(3) = 13, & g'(2) = \frac{1}{2}, & g'(3) = 7, \\ f(5) = 43, & g(5) = 23, & f'(5) = 41, & g'(5) = 29\,. \end{array}$$

Define the composition $C := g \circ f$. Then $C(2) =$ ⌞.....⌟ ; $C'(2) =$ ⌞.....⌟.

Please write each answer as a product of numbers; **do not** multiply out. [*Hint:* The Chain rule.]

A2: Math-Greek alphabet: Please write the **two** missing data of lowercase/uppercase/name. Eg:

"iota: ⌞.⌟ α: ⌞.....⌟ B: ⌞.....⌟." You fill in: ι I A *alpha* β *beta*.

Z: ⌞.....⌟ Δ: ⌞.....⌟ H: ⌞.....⌟

σ: ⌞.....⌟ γ: ⌞.....⌟ ξ: ⌞.....⌟

lambda ⌞.....⌟ rho ⌞.....⌟ omega ⌞.....⌟ mu ⌞.....⌟

End of Prereq-A

A1:	___ ___	95pts
A2:	___ ___	20pts
Total:	___ ___ ___	115pts

HONOR CODE: *"I have neither requested nor received help on this exam other than from my professor (or his colleague)."*
Name/Signature/Ord

Ord: ⌞.....⌟⌞.⌟⌞.⌟