

Please. Use “ $f(x)$ notation” when writing fncs; in particular, for trig and log fncs. E.g, write “ $\sin(x)$ ” rather than the horrible $\sin x$ or $[\sin x]$. Do **not** approx.: If your result is “ $\sin(\sqrt{\pi})$ ” then write that rather than .9797... Write expressions unambiguously e.g, “ $1/a + b$ ” should be bracketed either $[1/a] + b$ or $1/[a + b]$. (Be careful with **negative** signs!)

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

A1: Show no work.

z What is a polar bear? Answer:
A rectangular bear after a coordinate transform.

a The **slope** of line $3[y - 5] = 2[x - 1]$ is _____
Point **(4, y)** lies on this line, where $y =$ _____

b The solutions to equation $3x^2 = 1 - x$ are
 $x =$ _____

c $[\sqrt{3}^{\sqrt{2}}]^{\sqrt{8}} =$ _____ $\log_8(4) =$ _____

d Let $B(x) := x^x$. Its derivative, then, is
 $B'(x) =$ _____
[Hint: How is x^x defined ITO of the exponential fnc?]

e For fnc $y = h(x) := [5 + \sqrt[3]{x}]/2$, its inverse fnc
is $h^{-1}(y) =$ _____

f Suppose g is a fnc with g' never zero. Let h be
the inverse fnc of g . In terms of h , g and g' , write a
formula for $h'(x) =$ _____
[Hint: The Chain rule.]

f* Let $g(x) := x^3 + x$. Then $g^{-1}(10) =$ _____
and $[g^{-1}](10) =$ _____

g Below, f and g are differentiable fncs with

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

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.]

h Compute the sum of this geometric series:
 $\sum_{n=0}^{\infty} [-1]^n \cdot [3/5]^n =$ _____

i The Taylor series, centered at zero, for $\cos(2x)$ is
 $\cos(2x) =$ _____

A2: Write the uppercase versions of the following
Greek letters, along with their names.
Example: “ α : _____.” You fill in: A (alpha).

η : _____ λ : _____ σ : _____
 μ : _____ γ : _____

End of Prereq-A

A1: _____ 110pts

A2: _____ 10pts

Total: _____ 120pts

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

Ord: _____