Welcome, ACTors and ACTresses. This is a short-answer exam; Show no work. *Absolutely*, **positively**, do **NOT** hand-in "scratch work"!

A3: *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 $[1/g](3) \stackrel{\text{def}}{=\!=} 1/g(3) = 1/8$.

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

This is an **Open Brain** but **No calculator** exam.

> [z] Prof. King believes that writing in complete, coherent sentences is crucial in communicating Mathematics, improves posture, and whitens teeth. [Circle] one:
> **True!**   **Yes!**   *What's a sentence?*

[a] The solutions to $5x^2 = 2 - 2x$
are $x =$ ....

[b] $\left[\sqrt{2}^{\sqrt{27}}\right]^{\sqrt{3}} =$ .... $\log_8(4) =$ ....

[c] $\displaystyle\int_0^2 5^x \, \mathrm{d}x =$ ....

[d] Let $g(x) := 2x^3 + x^5$. Then $g^{-1}(3) =$ ....
and $[g^{-1}]'(3) =$ ....

[e] Let $y = f(x) := 7^{5^{x+2}}$.   Its inverse-function is $f^{-1}(y) =$ ....

[f] $\displaystyle\sum_{n=1}^{\infty} r^n = 4211$. So $r =$ .... or **DNE**.

[*Hint:* The sum starts with n at **one**, not zero.]

[g] Express this sum as a rational in lowest terms.
$\displaystyle\sum_{n=2}^{\infty} \frac{2^n - 5^n}{10^n} =$ ....

A4: 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: ....   H: .... Σ: ....

θ: .... ρ: .... λ: ....

omega ....   chi ....   psi ....   mu ....

A5: $\displaystyle\lim_{x \to 0^+} \frac{e^x - 1 - 5x}{x^2}$ equals [circle]:

$+\infty$, $-\infty$, zero, $-5/2$, -5, -1,
some-other-real-number,
DNE in $[-\infty, +\infty]$.

[*Hint:* To what extent does l'Hôpital's Rule apply?]

> End of Prereq-A

A3:	__ __	80pts
A4:	__ __	20pts
A5:	__ __	20pts
No name, or no honor code:	__	−5pts
Ouch!, scratch work handed-in :	__	−5pts
Total:	__ __ __	120pts

Please PRINT your Name

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