

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

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

T1:

a Using set-builder notation, define the set of primes.
 PRIMES = $\{n \in \text{WHAT} \mid \text{Conditions on } n\}$, using some of the symbols

such that, if, then, and, or, not, $0 \ 1 \ 2 \dots$
 $\forall \exists \# \in \mathbb{N} \mathbb{Z}_+ [a .. b] \bullet + =$

and *avoiding* “factor(s), divides, is-a-multiple, splits, irreducible, composite, Gcd, Lcm...” and similar, uh, cheats. Every quantification must specify its set!

b On \mathbb{Z}_+ , write $x \$ y$ IFF $xy < 0$. So \$ is Circle

Transitive *T F*. **Symmetric** *T F*.

Reflexive *T F*.

On \mathbb{Z} , say that $x \nabla y$ IFF $x - y \leq 1$. Then ∇ is:

Trans. *T F*. **Symm.** *T F*. **Reflex.** *T F*.

(Be *careful* on both parts!)

T2:

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

d Line $y = [M \cdot x] + B$ owns points **(4, 3)** and **(-2, 5)**.
 Hence $M =$ and $B =$

e Line $y = Mx + B$ is orthogonal to $y = \frac{1}{3}x + 2$ and owns **(2, 1)**. So $M =$ and $B =$

f The solutions to $3x^2 = 2 - 2x$
 are $x =$

g The four solutions to $[y - 2] \cdot y \cdot [y + 2] = -1/y$
 are $y =$

[Hint: Apply the Quadratic Formula to y^2 .]

h $[\sqrt{3}^{\sqrt{2}}]^{\sqrt{8}} =$ $\log_{64}(16) =$

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

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

k For natural number K , the sum $\sum_{n=3}^{3+K} 4^n$ equals

l $\sum_{n=1}^{\infty} r^n = \frac{5}{8}$. So $r =$ or **DNE**.
 [Hint: The sum starts with n at **one**, not zero.]

T3: Math-Greek alphabet: Please write the **two** missing data of lowercase/uppercase/name. Eg:

“iota: α : β : ..” You fill in: ι I A **alpha** β **beta**.
 Ω : Ψ : H :
 σ : γ : λ :
 theta rho delta mu

End of Prac-prereq-T

Print name Ord:

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

Signature: