NT-Cryptography
MAT4930 *7554*

Matt Prereq-A

Prof. JLF King
1Sep2015

A1:	___ ___	35pts
A2:	___ ___ ___	100pts
A3:	___ ___	20pts
Essay not double-spaced:	___ ___	−15pts
Total:	___ ___ ___	155pts

In complete English sentences on your own sheets of paper, please write, double-spaced, this proof. Do **not** *restate the problem.*

A1: Prove that the set of primes is infinite. [Euclid's theorem]

A2: *Show no work. Please write* **DNE** *in a blank if the described object does not exist or if the indicated operation cannot be performed.*

a Euler $\varphi(121000) =$ ⌞. . . . . ⌟ .
Express your answer as a product $p_1^{e_1} \cdot p_2^{e_2} \cdot \ldots$ of *primes* to posint powers, with $p_1 < p_2 < \ldots$.

b LBolt gives $G := \text{Gcd}(413, 294) =$ ⌞. . . . . ⌟ . And $413S + 294T = G$, where $S =$ ⌞. . . . . ⌟ & $T =$ ⌞. . . . . ⌟ are integers.

c Since $4800 = 2^6 \cdot 3^1 \cdot 5^2$, it has ⌞. . . . . ⌟ many positive divisors. [Write ANS naturally as a product of integers.]

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

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

A3: **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*.

Ω: ⌞. . . . . ⌟ Λ: ⌞. . . . . ⌟ Γ: ⌞. . . . . ⌟

ξ: ⌞. . . . . ⌟ σ : ⌞. . . . . ⌟ η: ⌞. . . . . ⌟

rho ⌞. . . . . ⌟ theta ⌞. . . . . ⌟ zeta ⌞. . . . . ⌟ mu ⌞. . . . . ⌟

End of Matt Prereq-A