ÇANKAYA UNIVERSITY
Department of Mathematics and Computer Science

MATH 365
Elementary Number Theory I

1st Midterm
November 12, 2007
16:40-18:00

Surname : _____
Name : _____
ID # : _____
Department : _____
Section : _____
Instructor : _____
Signature : _____

- The exam consists of 6 questions.
- Please read the questions carefully and write your answers under the corresponding questions. Be neat.
- Show all your work. Correct answers without sufficient explanation might not get full credit.
- Calculators are not allowed.

GOOD LUCK!

Please do not write below this line.

Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
20	20	20	20	20	10	110

1. Find the greatest common divisor g of 291 and 573 in two different ways.

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2. Find all solutions to the linear Diophantine equation

$$34x + 24y = 1000$$

in nonegative integers x and y.

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3. Find all solutions to $15x + 16y = -1,000$ with
a) $x \leq 0$ and $y \leq 0$.
b) $x \geq 0$ and $y \geq 0$.

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4. Describe the solutions (if any) in x to the congruence $10x \equiv 15 \pmod{35}$.

5. What is the least residue of
a) $33 \cdot 26^2 \pmod{31}$?
b) $50^{99} \pmod{7}$?

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6. (Bonus) What is the remainder when $3^{202} + 5^9$ is divided by 8?