ÇANKAYA UNIVERSITY
Department of Mathematics and Computer Science

MATH 365
Elementary Number Theory I
First Midterm Practice Exam (D)

November 12, 2007
16:40 − 18:00

In problems 1 through 6, tell whether or not the equation has a solution.

1. $3x + 5y = 50,001$

2. $6x + 9y = 60,001$

3. $21x - 14y = 10,000$

4. $-12x + 42y = 366$

5. $529x + 2024y = 391$

6. $851x + 1147y = 481$

Use the Euclidean Algorithm method to find one solution to the equations in problems 7 through 12.

7. $7x + 20y = 3$

8. $8x + 21y = 5$

9. $66x + 51y = 300$

10. $65x + 50y = 300$

11. $200x - 300y = 400$

12. $55x + 200y = -100$

In problems 13 through 19, find all solutions with x and y positive.

13. $5x + 6y = 100$

14. $6x + 7y = 200$

15. $6x + 8y = 120$

16. $9x + 6y = 150$

17. $121x + 561y = 13,200$

18. $169x + 663y = 2340$

19. $621x + 1026y = 49,194$

20. If $abc \neq 0$, is it possible for $ax + by = c$ to have infinitely many solutions in positive integers?

21. For what triples a, b, c is it true that for each integer x there is an integer y such that $ax + by = c$?