August 25, 2004

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MATH 65S
CRYPTOGRAPHY AND SOCIETY
ASSIGNMENT 1

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Due: Monday, August 30, 2004.

Journal: Write a one-page (12 pt, single-spaced) explication of the first chapter of Singh's book. Summarize what you feel are the major points made about the nature and use of cryptography.

1. Find the quotient and remainder in the Division Algorithm, if the divisor is 17 and the dividend is

    (i) 1000
   (ii) 289
  (iii) -44
  (iv) -100

2. Evaluate each of the following expressions:

    (i) $3 - 15 * 2 \mod 8$
   (ii) $3 * 15 - 4 \mod 8$
  (iii) $5^3 \mod 7$
  (iv) $2 * 98 + 83 \mod 95$
   (v) $(-8) * 13 - 11 \mod 9$
  (vi) $79^8 \mod 81$
 (vii) $79^8 \mod 8$

3. For which positive integers m are the following statements true?

    (i) $27 \equiv 5 \pmod{m}$
   (ii) $1331 \equiv 0 \pmod{m}$
  (iii) $1000 \equiv 1 \pmod{m}$

4. Find $a \mod 13$ where $a =$

    (i) 22
   (ii) 100
  (iii) 1000
  (iv) -1
   (v) -100
  (vi) -1000

5. What time does a clock read when it is

(i) 29 hours after it reads 11

(ii) 100 hours after it reads 2

(iii) 50 hours after it reads 6

6. Construct tables for addition, subtraction and multiplication mod 6.