

# Lab 9 for Math 215

Wednesday - March 19th, 2008

**Student's Name:** \_\_\_\_\_

**Instructions:** Show all your work for full credit. Indicate your answers clearly.

**Problem 1.** Decipher the ciphertext

31 16 39 4 21 40 32 12 40 21 12  
16 31 30 8 21 40 32 12 6 6 12 31 5 16 12 5 21

that was enciphered using a General Multiplication-Shift Cipher with an enciphering multiplier of  $a = 33$ , an enciphering shift of  $b = 20$  and a modulus of  $n = 41$ .

**Problem 2.** Decipher the ciphertext

42 43 37 43 9 15 36 43 23 23 70 21 2 2 70 49 42 43 2  
43 16 49 64 2 70 49 22 49 2 2 49 64 17 1 17 1 17  
35 21 22 22 49 42 10 1 2 17 71 35 21 22 22 49 42 21  
2 1 2 2 22 49 51

which was enciphered using a General Multiplication-Shift Cipher with an enciphering multiplier of  $a = 7$ , an enciphering shift of  $b = 14$ , and a modulus of  $n = 76$ .

**Problem 3.** Decipher the ciphertext

55 43 5 54 15 33 44 51 43 43 36 14 15 24 54 44 35 31

which was enciphered using a General Multiplication-Shift Cipher with an enciphering multiplier of  $a = 10$  and a modulus of  $n = 61$ .

**Problem 4.** Decipher the ciphertext

53 113 205 265 173 144 265 24 264 205 204 24 143  
53 24 113 54 24 265 173 202

which was enciphered using a General Multiplication-Shift Cipher with an enciphering multiplier of  $a = 30$ , an enciphering shift of  $b = 175$ , and a modulus of  $n = 301$ .