

**HOMEWORK ASSIGNMENT 4**  
**AMAT326 (S09)**

Due: March 12 (Thursday)

- (1) Show that  $3^{1728} \equiv 1 \pmod{1729}$ .
- (2) Solve  $313x \equiv 1 \pmod{453}$ .
- (3) Write down the addition and multiplication tables for arithmetic modulo 5.
- (4) In  $\mathbb{Z}/11\mathbb{Z}$ , solve  $[6]X = [3]$ .
- (5) In  $\mathbb{Z}/14\mathbb{Z}$ , find the solution to  $[6]X = [10]$ .
- (6) Prove that 9 divides  $a$  if and only if 9 divides the sum of the digits of  $a$ .  
(For example, 1251 is divisible by 9, since the sum of digits,  $1 + 2 + 5 + 1 = 9$ , is divisible by 9.)

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