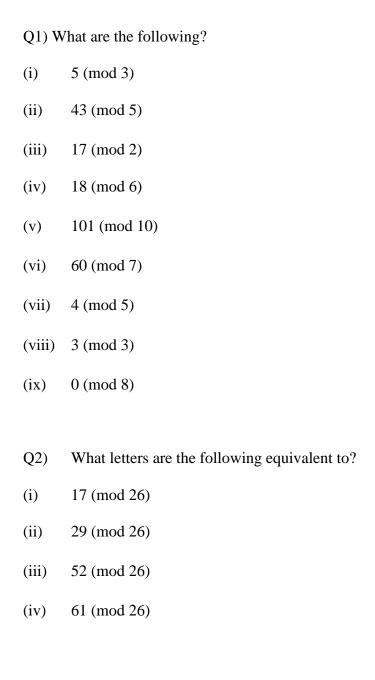
<u>Section 1 Lecture 3 – Modular Arithmetic - Exercises</u>



- Q3) (Additional some questions for you to think about if you are interested!)
- (i) What would $x \pmod{1}$ be for any integer x?
- (ii) What would $n \pmod{n}$ be for any positive integer n?
- (iii) Can you define $x \pmod{0}$?
- (iv) Research and list as many uses of modular arithmetic as you can find. Can you find a use in a field you are interested in (for example, if you are interested in music, find a use in music)?
- (v) Consider the set of integers (mod 5), which is 0, 1, 2, 3, 4. Each of these apart from 0 has an "inverse" that is you can multiply it by another number in the set to get 1 (mod 5). For example, the inverse of 2 is 3, since $2 \times 3 = 6 = 1 \pmod{5}$. Check it works for all the numbers (apart from 0). Under what circumstances will this work in general for (mod n)?