

# MTH210: Lab 1

## PNGR and Inverse Transform Method

(New code that you write for this assignment can be saved in new `*.R` files and pushed back to the repository.)

1. Read through the code in `PRNG.R` that attempts to implement the multiplicative congruential method to generate pseudo-random numbers. (Some values are missing in those.) Try various values of  $m$ ,  $a$ , and the seed  $x_0$ , and assess the performance of the generator.
2. Change the code in `PRNG.R` to implement the mixed congruential method. Is there much visible difference between these methods?
3. Write a function to generate a  $\text{Bern}(p)$  random draw using Inverse Transform method. Call this function `myBern`.
4. For  $p = .25$ , call the `myBern` function 1000 times and come up with a method to check whether `myBern` is coded correctly.
5. Using only `runif()` function, write your version of the `sample` function, called `mySample`. It should have all the features of the `sample` function.