b) Mixed Congruential method.

- The selection of a, c, m and X_0 drastically affects the statistical properties such as mean and variance and the cycle length.
- When $c \neq 0$, in $X_{i+1} = (aX_i + c) \bmod m$; $i = 0, 1, 2 \cdots$ the form is called the mixed congruential method, when $c = 0$, the form is known as the multiplicative congruential method.

Example

Using Linear congruential method, to generate a sequence of random numbers with $X_0 = 27$, a = 17, [illegible] and $m = 100$

Soln:

As $c \neq 0$, it is a mixed congruential method.

The X_i and R_i values are:

$X_1 = (17 \times 27 + 43) \bmod 100 = 502 \bmod 100 = 2$ $\quad R_1 = 2/100 = 0.02$

$X_2 = (17 \times 2 + 43) \bmod 100 = 77$ $\quad R_2 = 77/100 = 0.77$

$X_3 = (17 \times 77 + 43) \bmod 100 = 52$ $\quad R_3 = 52/100 = 0.52$

$X_4 = (17 \times 52 + 43) \bmod 100 = 27$ $\quad R_4 = 27/100 = 0.27$