

## PROBLEM:

Suppose that a system is defined by the following operator

$$H(z) = 1 - z^{-1}$$

- (a) Prove that when the input to this system is periodic with period  $M$ , that the output will also be periodic with the same period.
- (b) When the input to the system is the periodic signal:

$$x[n] = \begin{cases} +1 & \text{when } n = 0, \pm 3, \pm 6, \dots \\ -1 & \text{when } n = \dots, -8, -5, -2, 1, 4, 7, \dots \\ 0 & \text{when } n = \dots, -7, -4, -1, 2, 5, 8, \dots \end{cases}$$

determine the functional form for the output signal  $y[n]$ .