

AUSTRALIAN NATIONAL UNIVERSITY
Department of Engineering

ENGN6612/4612 Digital Signal Processing and Control
Problem Set #3 Inverse z -Transform

Q1

Using properties of z -transform, find the z -transform of the following discrete-time functions:

- (a) $n u[n]$
- (b) $n^2 u[n]$
- (c) $nc^n u[n]$ (challenge problem)
- (d) $u[k-2]$

Q2

Using the method based on partial fraction expansion, find $x[n]$ if $X(z)$ equals:

- (a) $\frac{z+1}{(z-2)(z+3)}$
- (b) $\frac{2z-3}{z(z-0.5)(z+0.3)}$
- (c) $\frac{z}{(z-1)(z-4)}$
- (d) $\frac{100z^2}{(z-1.1)(z-1)}$
- (e) $\frac{0.1z(z+1)}{(z-1)^2(z-0.6)}$ (challenge problem)

Also plot $x[n]$ for $0 < n < 4$