

Table 1: Table of z -Transforms (we consider all functions (signals) as defined only on $t \geq 0$)

No	$f[k]$	$F[z]$
1	$\delta[k - j]$	z^{-j}
2	$u[k]$	$\frac{z}{z - 1}$
3	$ku[k]$	$\frac{z}{(z - 1)^2}$
4	$k^2u[k]$	$\frac{z(z + 1)}{(z - 1)^3}$
5	$k^3u[k]$	$\frac{z(z^2 + 4z + 1)}{(z - 1)^4}$
6	$\gamma^{k-1}u[k - 1]$	$\frac{1}{z - \gamma}$
7	$\gamma^k u[k]$	$\frac{z}{z - \gamma}$
8	$k\gamma^k u[k]$	$\frac{\gamma z}{(z - \gamma)^2}$
9	$k^2\gamma^k u[k]$	$\frac{\gamma z(z + \gamma)}{(z - \gamma)^3}$
10	$\frac{k(k - 1)(k - 2) \cdots (k - m + 1)}{\gamma^m m!} \gamma^k u[k]$	$\frac{z}{(z - \gamma)^{m+1}}$
11a	$ \gamma ^k \cos \beta k u[k]$	$\frac{z(z - \gamma \cos \beta)}{z^2 - (2 \gamma \cos \beta)z + \gamma ^2}$
11b	$ \gamma ^k \sin \beta k u[k]$	$\frac{z \gamma \sin \beta}{z^2 - (2 \gamma \cos \beta)z + \gamma ^2}$
12a	$r \gamma ^k \cos(\beta k + \theta)u[k]$	$\frac{rz[z \cos \theta - \gamma \cos(\beta - \theta)]}{z^2 - (2 \gamma \cos \beta)z + \gamma ^2}$
12b	$r \gamma ^k \cos(\beta k + \theta)u[k] \quad \gamma = \gamma e^{j\beta}$	$\frac{(0.5re^{j\theta})z}{z - \gamma} + \frac{(0.5re^{-j\theta})z}{z - \gamma^*}$
12c	$r \gamma ^k \cos(\beta k + \theta)u[k]$	$\frac{z(As + B)}{z^2 + 2az + \gamma ^2}$
$r = \sqrt{\frac{A^2 \gamma ^2 + B^2 - 2AaB}{ \gamma ^2 - a^2}}$		
$\beta = \cos^{-1} \frac{-a}{ \gamma }, \theta = \tan^{-1} \frac{Aa - B}{A\sqrt{ \gamma ^2 - a^2}}$		

Table 2: Table of z -Transforms Properties

Operation	$f[k]$	$F[z]$
Addition	$f_1[k] + f_2[k]$	$F_1[z] + F_2[z]$
Scalar multiplication	$af[k]$	$aF[z]$
Right-shift	$f[k - m]u[k - m]$	$\frac{1}{z^m}F[z]$
	$f[k - m]u[k]$	$\frac{1}{z^m}F[z] + \frac{1}{z^m} \sum_{k=1}^m f[-k]z^k$
Left-shift	$f[k + m]u[k]$	$z^m F[z] - z^m \sum_{k=0}^{m-1} f[k]z^{-k}$
Multiplication by γ^k	$\gamma^k f[k]u[k]$	$F\left[\frac{z}{\gamma}\right]$
Multiplication by k	$k f[k]u[k]$	$-z \frac{d}{dz} F[z]$
Time Convolution	$f_1[k] * f_2[k]$	$F_1[z]F_2[z]$
Frequency Convolution	$f_1[k]f_2[k]$	$\frac{1}{2\pi j} \oint F_1[u]F_2\left[\frac{z}{u}\right] u^{-1} du$