★ z 変換の 4 法則 ★

線形	$\mathcal{Z}[ax_n + by_n] = a\mathcal{Z}[x_n] + b\mathcal{Z}[y_n]$ $\mathcal{Z}^{-1}[aX(z) + bY(z)] = a\mathcal{Z}^{-1}[X(z)] + b\mathcal{Z}^{-1}[Y(z)]$
シフト	$\mathcal{Z}[x_{n+1}] = zX(z) - x_0 z$ $\mathcal{Z}[x_{n+2}] = z^2X(z) - x_0 z^2 - x_1 z$ $\mathcal{Z}[x_{n+3}] = z^3X(z) - x_0 z^3 - x_1 z^2 - x_2 z$ $\mathcal{Z}[x_{n+k}] = z^kX(z) - x_0 z^k - x_1 z^{k-1} - \cdots - x_{k-1} z$ $\mathcal{Z}[x_{n-1}] = z^{-1}X(z) + x_{-1}$ $\mathcal{Z}[x_{n-2}] = z^{-2}X(z) + x_{-1}z^{-1} + x_{-2}$ $\mathcal{Z}[x_{n-3}] = z^{-3}X(z) + x_{-1}z^{-2} + x_{-2}z^{-1} + x_{-3}$ $\mathcal{Z}[x_{n-k}] = z^{-k}X(z) + x_{-1}z^{-(k-1)} + x_{-2}z^{-(k-2)} + \cdots + x_{-k}$
微分	$\mathcal{Z}[n \cdot x_n] = -z \cdot \frac{d}{dz}\mathcal{Z}[x_n]$
指数倍	$\mathcal{Z}[x_n] = X(z)$ のとき $\mathcal{Z}[a^n x_n] = X(a^{-1}z)$

★ z 変換表 ★

数列［信号］ x_n	**z 変換** $X(z)$	**数列［信号］** x_n	**z 変換** $X(z)$
1	$\frac{z}{z-1}$ $\left[\frac{1}{1-z^{-1}}\right]$	a^n	$\frac{z}{z-a}$ $\left[\frac{1}{1-az^{-1}}\right]$
n	$\frac{z}{(z-1)^2}$ $\left[\frac{z^{-1}}{(1-z^{-1})^2}\right]$	na^n	$\frac{az}{(z-a)^2}$ $\left[\frac{az^{-1}}{(1-az^{-1})^2}\right]$
n^2	$\frac{z(z+1)}{(z-1)^3}$	n^2a^n	$\frac{az(z+a)}{(z-a)^3}$
${}_nC_1$ (n)	$\frac{z}{(z-1)^2}$	na^{n-1}	$\frac{z}{(z-a)^2}$
${}_nC_2$	$\frac{z}{(z-1)^3}$	${}_nC_2 \cdot a^{n-2}$	$\frac{z}{(z-a)^3}$
${}_nC_3$	$\frac{z}{(z-1)^4}$	${}_nC_3 \cdot a^{n-3}$	$\frac{z}{(z-a)^4}$
${}_nC_k$	$\frac{z}{(z-1)^{k+1}}$	${}_nC_k \cdot a^{n-k}$	$\frac{z}{(z-a)^{k+1}}$
$\sin bn$	$\frac{z\sin b}{z^2 - 2z\cos b + 1}$	$\cos bn$	$\frac{z^2 - z\cos b}{z^2 - 2z\cos b + 1}$