

Find the Z-transform of the following discrete-time sequences:

1. $x_1[n] = \alpha^n u[n]$, where $\alpha \in \mathbb{C}$

2. $x_2[n] = \left(\frac{1}{2}\right)^n u[n] + \left(-\frac{1}{3}\right)^n u[n]$

3. $x_3[n] = -a^n u[-n - 1]$, where $a \in \mathbb{R}$

$$4. \ x_4[n] = -\left(\frac{1}{2}\right)^n u[-n-1] + \left(-\frac{1}{3}\right)^n u[n]$$

$$5. \ x_5[n] = \left(\frac{1}{2}\right)^n u[n] - \left(-\frac{1}{3}\right)^n u[-n-1]$$

$$6. \ x_6[n] = a^n u[n] u[-n+M-1], \text{ where } a \in \mathbb{R}$$