Exercises Week1

DSP

1. Compute the convolution of the two sequences $x_1 = ...0, 0, 1, 2, \underset{\uparrow}{1}, 3, 1, 4, 0, 0, ...$ and $x_2 = ...0, 0, 3, \underset{\uparrow}{2}, 1, 0, 0, ...$, in two ways:
   a. in the time domain
   b. using the Z transform
2. Find the Z transform of the following signals
   a.
   $$x[n] = \begin{cases} \left(\frac{1}{3}\right)^n, & n \geq 0 \\ \left(\frac{1}{2}\right)^{-n}, & n < 0 \end{cases}$$
   b.
   $$x[n] = \left(\frac{1}{2}\right)^n \sin(\frac{\pi}{3}n)u[n]$$