1. Write down the first 6 terms of the sequence whose $n$th term is $a_n = \frac{(-1)^n}{n}$.

2. Use the Squeeze Theorem to show that the sequence above converges.

3. The sequence of Lucas numbers is defined recursively by

$$
\begin{cases}
\ell_1 = 2 \\
\ell_2 = 1 \\
\ell_n = \ell_{n-1} + \ell_{n-2} & n > 2.
\end{cases}
$$

Write down the first 6 terms of the sequence.

4. Does the sequence of Lucas numbers converge? Why/why not?