EDDE. PROBLEM SET 8 – ANSWERS

1. a) $a_n = A \cdot \left(\frac{5}{3}\right)^n$
   b) $a_n = A \cdot 4^n + B \cdot 2^n$
   c) $a_n = A \cdot 5^n + B$
   d) $a_n = A \cdot 3^n + B \cdot n \cdot 3^n$
   e) $a_n = A \cdot (3+i)^n + B \cdot (3-i)^n$
   f) $a_n = A \cdot \left(\frac{1+\sqrt{5}}{2}\right)^n + B \cdot \left(\frac{1-\sqrt{5}}{2}\right)^n$
   g) $a_n = A + B \cdot n$
   h) $a_n = A \cdot (1+i)^n + B \cdot (1-i)^n = (\sqrt{2})^n \cdot \left(C \cdot \cos\left(\frac{n\pi}{4}\right) + D \cdot \sin\left(\frac{n\pi}{4}\right)\right)$

2. a) $a_n = A \cdot \left(\frac{5}{3}\right)^n + \frac{1}{10} \cdot 5^n - \frac{1}{4} \cdot 3^n + 2 \cdot 2^n + 2$
   b) $a_n = A + \frac{1}{2} \cdot n^2 + \frac{1}{2} \cdot n$
   c) $a_n = A + \frac{1}{3} \cdot n^3 + \frac{1}{2} \cdot n^2 + \frac{1}{6} \cdot n$
   d) $a_n = A \cdot 4^n + B \cdot 2^n - 3^n + \frac{1}{3}$
   e) $a_n = A + B \cdot n + \frac{1}{2} \cdot n^2$
   f) $a_n = A \cdot 5^n + B - \frac{n}{4}$
   g) $a_n = A \cdot \left(\frac{1+\sqrt{5}}{2}\right)^n + B \cdot \left(\frac{1-\sqrt{5}}{2}\right)^n + 2^n$
   h) $a_n = A + B \cdot n + \frac{1}{6} \cdot n^3 - \frac{1}{2} \cdot n^2$

3. a) $a_n = \frac{1}{\sqrt{5}} \cdot \left(\left(\frac{1+\sqrt{5}}{2}\right)^n - \left(\frac{1-\sqrt{5}}{2}\right)^n\right)$
   b) $a_n = \frac{1}{6} \cdot n^3 - \frac{1}{2} \cdot n^2 + \frac{1}{3} \cdot n = \frac{n(n-1)(n-2)}{6}$
   c) $a_n = (\sqrt{2})^n \cdot \sin\left(\frac{n\pi}{4}\right)$