§2.1: 10, 18, 22

§2.2: 6, 30, 34, 48, 52, 54, 58, 80, 86, 90, 100, 106, 108, 112, 116 (OK to use a calculator to find the first few sequence terms in 112 and 116), 122, 126, 128

Also do the following.

Problem 1. Let $R$ be a real number satisfying $0 < R < 1$, and define a sequence $(a_n)$ by $a_n := \sum_{k=0}^{n} R^k$ for $n = 0, 1, 2, \ldots$.

(a) Write out the first four sequence terms $a_0, a_1, a_2, a_3$ when $R = 1/2$ (simplify your answers) and $R = 1/\pi$ (no need to simplify).

(b) For general $R$ as above, show that for any $n = 0, 1, 2, \ldots$, we have

$$a_n + R^{n+1} = 1 + Ra_n.$$ 

(c) Use part (b) to solve for $a_n$ in terms of $R$ and compute $\lim_{n \to \infty} a_n$ (your answer will be in terms of $R$ but, as for any limit problem, not in terms of $n$). In the special case $R = 1/2$, does your answer seem reasonable in light of the terms you calculated in part (a)?