Class 23: Sequences
Calculus II
College of the Atlantic. March 2, 2023

1. Write out the first four terms of the sequences whose general terms are given by:

$$s_n = n^3 \tag{1}$$

$$s_n = \frac{(-1)^n}{n} \tag{2}$$

$$s_n = \frac{2n - 2}{n^2} \ . \tag{3}$$

2. Determine the general term for the sequences below. (Call the first term in the sequence $n = 1$.)

$$1, 4, 9, 16, 25, 36, \ldots \tag{4}$$

$$4, 9, 16, 25, 36, \ldots \tag{5}$$

$$1, -1, 1, -1, 1, -1, \ldots \tag{6}$$

$$\frac{3}{5}, \frac{4}{25}, \frac{5}{125}, \frac{6}{625}, \ldots \tag{7}$$

$$1, 5, 1, 5, 1, 5, \ldots \tag{8}$$

3. Write out the first four terms of the following recursively defined sequences:

$$s_{n+1} = \frac{1}{2}(s_n + 6), \quad s_1 = 2 \ . \tag{9}$$

$$s_{n+1} = \sqrt{s_n}, \quad s_1 = 1 \ . \tag{10}$$

$$s_n = n s_{n-1}, \quad s_1 = 1 \ . \tag{11}$$

Do these sequences converge? If so, what are they converging to?