11.1 – 11.3 Sequence and Series Practice Problems

1. Suppose you drop a tennis ball from a height of 15 feet. After the ball hits the floor, it rebounds to 85% of its previous height.

a. How high will the ball rebound after its third bounce?

b. How far will the ball travel in height from the time it was dropped to the time it comes to rest?

2. You are stacking soup cans for a display. The manager wants you to stack 210 cans in layers, with each layer after the top having one more can than the layer above it. One can is in the top layer. If you must use all 210 cans, how many layers will there be, and how many cans will be in the bottom layer?

3. An annuity is a sequence of periodic payments. The payments could be for a loan, investment or retirement fund. A deposit of $330 dollars in made at the beginning of each month for 30 years and earns 1% compounded monthly. What is the value of this annuity at the end of the 30 years?

4. How many terms are contained in $\sum_{x=0}^{10} (3x)!-3x$?

5. Following series is geometric: $30 + 20 + 40/3 + \ldots + 1280/729$.
a. Express the series in summation notation.

b. Find the sum.

6. Express $4/9$ in summation notation.

7. Consider yourself, your parents, your grandparents, your great-grandparents, and so on all the way back to your grandparents with the word "great" used 40 times. What is the total number of people you are considering?

8. Write the first 5 terms of the recursive sequence given $a_1 = 6$, $a_2 = 10$ and $a_{n+2} = 2(a_n) - a_{n+1}$.

9. Given two terms in an arithmetic sequence are $a_{21} = -17$ and $a_{37} = -9$, find:
a. Find the nth term formula.

b. Express the 50^{th} partial sum in summation notation and find the sum.