

NCLS Math 7 Homework, 5/13/2012 **Name:**_____

Geometric Series

1. Compute the sum of each of the following geometric series:
 - (a) $-1 - 3 - 9 - 27 - 81 - 243 - 729$
 - (b) $3 - 6 + 12 - 24 + 48 - \dots + 768$
 - (c) $100 + 10 + 1 + 0.1 + 0.01 + \dots$
 - (d) $8 - 6 + 9/2 - 27/8 + \dots$
2. Find a simple expression equal to $1 + 2 + 2^2 + 2^3 + 2^4 + \dots 2^n$
3. In each part below, find the fraction that is equal to the given decimal.
 - (a) $0.\overline{4}$
 - (b) $0.\overline{273}$
 - (c) $0.63\overline{5}$
 - (d) $0.88\overline{1}$
4. Each term in the sequence $a_1 = 1, a_2 = 0.2, a_3 = 0.04, a_4 = 0.008, \dots$ is obtained by doubling the previous term of then shifting the decimal point one place to the left. What is the sum of all the term sin the sequence?
5. Find all values of x that satify $x = 1 - x + x^2 - x^3 + x^4 - x^5 + \dots$
6. For each geometric sequence below, find the sum of the first n terms:
 - (a) $a_1 = 3, r = 2, n = 6$
 - (b) $a_1 = -.27, r = -1/3, a_n = 1/90$
7. For a geometric sequence, the sum of first 5 terms is 10, the sum of 10 terms is 50, what is the sum of the first 15 terms?
8. $\{a_n\}$ is a geometric sequence, S_n is the sum of its first n terms. Prove that $S_7, S_{14} - S_7, S_{21} - S_{14}$ is also a geometric sequence.
9. $\{a_n\}$ is a geometric sequence, S_n is the sum of its first n terms, and S_3, S_9, S_6 form an arithmetic sequence. Prove that a_2, a_8, a_5 is also an arithmetic sequence.