

COT 3100 Recitation: Arithmetic Geometric Series Problems

Set #1

- 1) An arithmetic series has a fourth term equal to 13 and its tenth term equal to 31. What is the sum of the first 100 terms of the series?
- 2) In a given arithmetic sequence the first term is 2, the last term is 29 and the sum of the terms is 155. What is the common difference of the sequence?
- 3) Find the value of $a_2 + a_4 + a_6 + \dots + a_{98}$, if a_1, a_2, a_3, \dots , is an arithmetic progression with common difference 1 and the sum of the first 98 terms of the sequence is 137.
- 4) The geometric series $a + ar + ar^2 + \dots$ has a sum of 7, and the terms involving odd powers of r have a sum of 3. What is $a + r$?

Set #2

- 1) A sequence of three real numbers forms an arithmetic progression with the first term 9. If 2 is added to the second term and 20 is added to the third term, the three resulting numbers form a geometric progression. What is the smallest possible value for the third term of the geometric progression?
- 2) The sequence $a_1, a_2, \dots, a_n, n > 1$ is an arithmetic sequence with $a_1 = 10, a_n = 50$, and a common difference, d , that is a positive integer. What is the sum of all the possible values of d ?
- 3) In an arithmetic sequence the sum of the 72nd term and the 112th terms is 22. What is the sum of the first 183 terms of this sequence? To prove that the sequence is not unique, provide the first term and common difference of two difference sequences that satisfy the requirements given in this problem. Make sure both of your sample sequences have non-zero common differences.
- 4) a, b and c form an arithmetic sequence with a non-zero common difference. If a is increased by 1, the resulting sequence is a geometric sequence. Alternatively, if c is increased by 2, the resulting sequence is also a geometric progression. What is b ?