

NCLS Math 7A Homework, 05/06/2012

Name: _____

Geometric Sequence

- Consider the geometric sequence 3, $9/2$, $27/4$, $81/8$, ...
 - Find the 8th term in the sequence
 - Find a formula for the nth term in the sequence.
- A geometric sequence starts 16, -24, 36, -54.
 - What is the common ratio of the sequence?
 - If the nth term is -273.375, then what is n?
- An amoeba is placed in a puddle one day, and on the same day it splits into two amoebas. The next day, each new amoeba splits into two new amoebas, and so on, so that each day every living amoeba splits into two new amoebas.
 - After one week, how many amoebas are in the puddle? (Assume the puddle has no amoebas before the first one is placed there.)
 - What is the first day that the puddle is half full of amoebas if the puddle is exactly completely full of amoebas after the amoebas split on the 23rd day.
- The fifth and seventh terms of a geometric sequence are 3 and 9. What are all possible values of the sixth term of the sequence?
- In this problem we prove that if a term in a geometric sequence of positive numbers is exactly between two other terms in the sequence, then the term is the geometric mean of the other two terms. Let a_1 , a_2 , a_3 , ... be a geometric sequence.
 - Let a_{n-k} , a_n , and a_{n+k} be three terms in this geometric sequence, so that a_n lies exactly between a_{n-k} and a_{n+k} in the sequence. If the first term of this sequence is a_1 , and the common ratio is r , express a_{n-k} , a_n , and a_{n+k} in terms of a_1 and r .
 - Use your answer from part (a) to show that $\sqrt{a_{n-k}a_{n+k}} = a_n$
- Nowadays computers can get infected via email virus. If the first round of infection can get to 80 computers, and starting from the first round, every infected computer will infect another 20 computers, by 5th round, how many computers will be infected?
- Insert 2 numbers between 9 and 243, so that they make a geometric sequence.
- Insert 4 numbers between 160 and 5, so that they make a geometric sequence.
- Given a geometric sequence $\{a_n\}$ with all positive numbers, is $\{\sqrt{a_n}\}$ a geometric sequence? Why?