Arithmetic and Geometric Sequences Review (2.1-2.3) NAMES:

1. Make up an example of an arithmetic sequence. Give at least six terms and also write the common difference down specifically.

2. Make up an example of a geometric sequence. Give at least six terms and also write the common ratio down specifically.

3. What is the difference between an arithmetic sequence and a geometric one?

4. The 17-year locust is named for the length of its lifespan. The locust is seen every 17 years but only in the last month of its life, the rest of its existence being spent underground. In Oklahoma, Kansas, and Missouri, it appeared in 1981.

a.) Write a number sequence listing the years of all of its appearances through the years 1850 to 2000. (I do not mean that the locust appeared in 1850. Use 1981 as a starting point and work your way backward through the 1850's and forward through the year 2000.)

b.) Suppose the locust had a predator with a life cycle of six years (during most of which it's in larval form) and that the predator appeared as an adult in 1855. Write a number sequence listing the years of all of the predator's appearances through the years 1850 to 2000.

c.) In what years did the locusts and predators both appear?

5. The successive terms of the following sequence are found by multiplying, but the sequence is **not** geometric.

1 2 6 24 120 720 …

a.) How do you think each term is found and what would you guess to be the seventh term?

b.) Why do we say this sequence is **not** geometric?

6. Is the binary sequence an example of an arithmetic or a geometric sequence? Explain.

7. Convert the following binary numbers into decimal form. Then answer the question.

a.) 111101

b.) 101010

c.) Explain the method of converting from binary to decimal numbers.

8. Suppose that each time a pair of jeans is washed, they lose some color and that the amounts of color left in the jeans after successive washings form a geometric sequence. Starting with a new pair of jeans having 100% color, suppose that the first three terms of the sequence (corresponding to the first three washings) are

95% 90.25% 85.7375%

a.) Find the common ratio of the sequence. How did you find this number?

b.) Use a calculator to find the next seven terms of the sequence. Round to four decimal places.

c.) Now round all terms to the nearest whole percent and complete the sequence below.

95% 90% 86% _____ _____ _____ _____ _____ _____ _____

d.) After how many washings do the jeans have about 90% of their original color?

e.) After how many washings do the jeans have about 70% of their original color?