Name: _____ **Date:** _____ **Per:** ____

ARITHMETIC AND GEOMETRIC SEQUENCE WORD PROBLEM EXAMPLES
All final solutions MUST use the formula.

1. A recovering heart attack patient is told to get on a regular walking program. The patient is told to walk a distance of 5 km the first week, 8 km the second week, 11 km the third week and so on for a period of 10 weeks. At that point the patient is to maintain the distance walked during the 10^{th} week. How far will the patient walk during the 10^{th} week?

a. Is the sequence arithmetic or geometric? Explain your answer.

b. Write out the sequence using blanks where appropriate.

c. Write an explicit formula for the sequence.

d. How far will the patient walk during the 10^{th} week? Show all work.

e. Write your final answer as a sentence.

2. A virus reproduces by dividing into two, and after a certain growth period, it divides into two again. As the virus continues to reproduce, it will continue to divide in two. How many viruses will be in a system starting with a single virus AFTER 10 divisions?

a. Is the sequence arithmetic or geometric? Explain your answer.

b. Write out the sequence using blanks where appropriate. Fill in the first three terms.

c. Write an explicit formula for the sequence.

d. How many viruses will be in a system starting with a single virus AFTER 10 divisions?

e. Write your final answer as a sentence.

3. Sam has purchased a $30,000 car for his business. The car depreciates 30% every year. Depreciation means the value of the car goes down by that percent each year. What will be the value of the car after the 5th year? Note: The car is 0 years old when purchased so the first year is the second entry in the sequence.

f. Is the sequence arithmetic or geometric? Explain your answer.

g. Write out the sequence using blanks where appropriate. Fill in the first two terms. Hint: If the car value decreases by 30%, what percent did it retain? Show all work.

h. Write an explicit formula for the sequence.

i. What will be the value of the car AFTER the 5th year? Show all work.

j. Write your final answer as a sentence.

4. Allen is on the football team this year but he has poor time management skills. His mother told him that he is off the team if he fails anything in school. On his first math quiz he earned a 90, then he earned an 86 and an 82 on his next two quizzes. If his grades continue at this rate, what will his quiz grade be after the 8th quiz? Will he still be on the team?

   a. Is the sequence arithmetic or geometric? Explain your answer.

   b. Write out the sequence using blanks where appropriate.

   c. Write an explicit formula for the sequence.

   d. What can he expect to get on his 8th quiz? Show all work.

   e. Write your final answer as a sentence.

5. Edgar is getting better at math. On his first quiz he scored 57 points, then he scores 61 and 65 on his next two quizzes. If his scores continued to increase at the same rate, what will be his score on his 9^{th} quiz? Show all work.

a. Write an explicit formula for the sequence. Explain where you found the numbers you are putting in the formula.

b. Identify the value of n and explain where you found it. Use the explicit formula to solve the problem.

c. Write your final answer as a sentence.

6. 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. How high will the ball rebound after its third bounce? Round to the nearest tenth.

a. Write an explicit formula for the sequence. Explain where you found the numbers you are putting in the formula.

b. Identify the value of n and explain where you found it. Use the explicit formula to solve the problem.

c. Write your final answer as a sentence.

7. Viola makes gift baskets for Valentine's Day. She has 13 baskets left over from last year, and she plans to make 12 more each day. If there are 15 work days until the day she begins to sell the baskets, how many baskets will she have to sell?

a. Write an explicit formula for the sequence. Explain where you found the numbers you are putting in the formula.

b. Identify the value of n and explain where you found it. Use the explicit formula to solve the problem.

c. Write your final answer as a sentence.

8. In a certain region, the number of highway accidents increased by 20% over a four year period. How many accidents were there in 2006 if there were 5120 in 2002? Hint: When the percent increases, you want the original 100% plus the additional 20%.

a. Write an explicit formula for the sequence. Explain where you found the numbers you are putting in the formula.

b. Identify the value of n and explain where you found it. Use the explicit formula to solve the problem.

c. Write your final answer as a sentence.

9. A house worth $350,000 when purchased was worth $335,000 after the first year and $320,000 after the second year. If the economy does not pick up and this trend continues, what will be the value of the house after 6 years.

a. Write an explicit formula for the sequence. Explain where you found the numbers you are putting in the formula.

b. Identify the value of n and explain where you found it. Use the explicit formula to solve the problem.

c. Write your final answer as a sentence.