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### IP Unit 5

**Name:**

**Section Number:**

**Please submit your assignment.**

- 1) Use the arithmetic sequence of numbers 1, 3, 5, 7, 9, ... to find the following:
  - a) What is  $d$ , the difference between any 2 terms?  
**Answer:**  
**Show work in this space.**
  - b) Using the formula for the  $n^{\text{th}}$  term of an arithmetic sequence, what is  $101^{\text{st}}$  term?  
**Answer:**  
**Show work in this space.**
  - c) Using the formula for the sum of an arithmetic series, what is the sum of the first 20 terms?  
**Answer:**  
**Show work in this space**
  - d) Using the formula for the sum of an arithmetic series, what is the sum of the first 30 terms?  
**Answer:**  
**Show work in this space**
  - e) What observation can you make about these sums of this series (HINT: It would be beneficial to find a few more sums like the sum of the first 2, then the first 3, etc.)?  
**Answer:**
- 2) Use the geometric sequence of numbers 1, 2, 4, 8, ... to find the following:
  - a) What is  $r$ , the ratio between 2 consecutive terms?  
**Answer:**  
**Show work in this space.**
  - b) Using the formula for the  $n^{\text{th}}$  term of a geometric sequence, what is the  $24^{\text{th}}$  term?  
**Answer:**

Show work in this space.

- c) Using the formula for the sum of a geometric series, what is the sum of the first 10 terms?

Answer:

Show work in this space

- 3) Use the geometric sequence of numbers  $1, 1/2, 1/4, 1/8, \dots$  to find the following:

- a) What is  $r$ , the ratio between 2 consecutive terms?

Answer:

Show work in this space.

- b) Using the formula for the  $n^{\text{th}}$  term of a geometric sequence, what is the  $10^{\text{th}}$  term?

Answer:

Show work in this space.

- c) Using the formula for the  $n^{\text{th}}$  term of a geometric series, what is the sum of the first  $12^{\text{th}}$  terms? Answer:

Show work in this space.

- d) What observation can make about these sums? In particular, what number does it appear that the sum will always be smaller than?

Answer:

- 4) CLASSIC PROBLEM - A traveling salesman (selling shoes) stops at a farm in the Midwest. Before he could knock on the door, he noticed an old truck on fire. He rushed over and pulled a young lady out of the flaming truck. Farmer Brown came out and gratefully thanked the traveling salesman for saving his daughter's life. Mr. Brown insisted on giving the man an award for his heroism.

So, the salesman said, "If you insist, I do not want much. Get your checkerboard and place one penny on the first square. Then place two pennies on the next square. Then place four pennies on the third square. Continue this until all 64 squares are covered with pennies." As he'd been saving pennies for over 25 years, Mr. Brown did not consider this much of an award, but soon realized he made a miscalculation on the amount of money involved.

- a) How much money would Mr. Brown have to put on the  $32^{\text{nd}}$  square?

Answer:

Show work in this space

- b) How much would the traveling salesman receive if the checkerboard only had 32 squares?

Answer:

Show work in this space

- c) Calculate the amount of money necessary to fill the whole checkerboard (64 squares). How much money would the farmer need to give the salesman?

Answer:

Show work in this space

## Part II

Using the index of a sequence as the domain and the value of the sequence as the range, is a sequence a function?

Include the following in your answer:

- Which one of the basic functions (linear, quadratic, rational, or exponential) is related to the arithmetic sequence?
- Which one of the basic functions (linear, quadratic, rational, or exponential) is related to the geometric sequence?

Give at least two real-life examples of a sequences or series. One example should be arithmetic, and the second should be geometric. Explain how these examples would affect you personally.