

Secondary Math III  
Assignment 11.4  
Finite & Infinite Geometric Series

Name: \_\_\_\_\_  
Period: \_\_\_\_\_

Use sigma notation to rewrite each finite geometric series. Then calculate the given sum (you do not need to use the formula). Round to 3 decimal places

1.  $2 + 6 + 18 + 54 + 162 ; S_5$

2.  $1 + (-4) + 16 + (-64) + 256 + (-1024); S_6$

3.  $\frac{1}{2} + \frac{1}{10} + \frac{1}{50} + \frac{1}{250} + \frac{1}{1250} + \dots; S_7$

4.  $-0.2 + (-0.02) + (-0.002) + \dots; S_4$

Find the sum of the series using the formula. Round to 3 decimal places.

5.  $\sum_{i=1}^7 2(3)^i$

6.  $\sum_{i=1}^8 \left(\frac{1}{2}\right)^i$

7.  $\sum_{i=1}^5 (-2)2^i$

8.  $\sum_{i=1}^{20} -3(0.4)^i$

Given the explicit formula find the sum of the series.

9. If  $a_n = 4^{n-1}$ , find  $S_{10}$

10. If  $a_n = \left(\frac{1}{4}\right)(2)^{n-1}$ , find  $S_7$

Find the sum of each infinite series. If the sum does not exist, write  $\infty$ .

11.  $\frac{1}{5} + \frac{1}{25} + \frac{1}{125} + \dots$

12.  $0.3 + 0.9 + 2.7 + \dots$

13.  $\sum_{i=1}^{\infty} \left(\frac{2}{7}\right)^i$

14.  $\frac{5}{7} + \frac{10}{21} + \frac{20}{63} + \dots$

15.  $\frac{1}{10} + \frac{3}{20} + \frac{9}{40} + \dots$

16.  $\sum_{i=1}^{\infty} 100(0.1)^i$

Solve each problem, using the geometric sequences and series formulas.

17. A rubber ball is dropped from a height of 800 centimeters and bounces on the ground. The table shows the height reached by the ball after each successive bounce. What is the total distance traveled by the ball from the first bounce to the fifth?

Bounce	Height (centimeters)
1	300
2	150
3	75
4	37.5
5	18.75

18. A small grocery store reviewed their net profits for the past 7 years and observed that profits increased by 2% per year. The table shows the net profits. What is the grocery store's total net profit for the past 7 years?

Year	Net Profit (dollars)
1	20,000
2	20,400
3	20,808
4	21,224.16
5	21,648.64
6	22,081.62
7	22,523.25