Hand-In Assignment - Geometric Sequences & Series

Name: _____ .

Formulas:

$$t_n = ar^{n-1} \qquad S_n = \frac{a(1-r^n)}{1-r} \qquad S_n = \frac{a-lr}{1-r} \qquad S = \frac{a}{1-r}$$

Where appropriate, show the process - not just the final answer!

1. Show the using of a formula to find t_7 for the geometric sequence that begins:

0.01, 0.08, 0.64, 5.12 . . .

2. Show the using of a formula to find the **sum** of the first 8 terms, S_8, given the sequence that begins: 50 + 37.5 + 28.125 + 21.09375 + . . .

3. Show the using of a formula to find the first term of a geometric series, given that $S_6 = 1092$ and $r = -3$.

4. Use an algebraic method to find t_{10} for the geometric sequence with $t_3 = 10,\ t_6 = 80$

5. Consider the geometric series: 3/4 + 9/4 + . . . + 729/4.
a) Determine the sum of this series.

b) Determine the number of terms in the series.

c) Express the series in sigma notation.

6. Write each series below using sigma notation. Do not find the sum.
a) 1/3 + 1/6 + 1/12 + 1/24 +1/48

b) $3-6+12-24+48-96$

7.. Determine the sum of the series. $\sum_{2}^{14} -3(-2)^k$

8. Determine t_5, given that an infinite geometric series has $S = 18$ and $r = \frac{2}{3}$

9. Where possible, find the sum of the following infinite series. If it is not possible, state "No finite sum."

a) 81 + 27 + 9 + 3 + . . .

b) $20 - 30 + 45 - 67.5 + ...$

10. Determine the infinite sum: $S = 0.3 + \frac{2}{100} + \frac{2}{1000} + \frac{2}{10000} + ...$

Give answer as a fraction.
(Hint – think carefully about what you use as the first term in the formula!)

11. A ball is dropped from a height of 4.0 meters to a floor. After each bounce, the ball rises to 60% of its previous height.

a) Determine the total vertical distance traveled when the ball hits the ground the 8^{th} time. (Correct to 2 decimal places.)

b) Determine the total vertical distance that the ball travels before coming to rest. (Correct to 2 decimal places.)

12. A geometric sequence consists of these terms: $2x+5,\ 3x,\ m$. The common ratio is $r=4$. What is the value of m ?

A. -4 B. -12 C. -16 D. -48

13. Determine the first term in the expansion of $\sum_{k=2}^{6} 4(5)^k$.

A. 4 B. 20 C. 100 D. 500

14. The number of terms in the series defined by $\sum_{n=8}^{w} (2n-10)$ is

A. w B. w – 7 C. w – 8 D. w – 9