Sequences and Series – more practice (14 questions)

1. Is the following sequence geometric?

a) $10, 15, 22.5, 33.75, \ldots$

b) $7, 14, 21, 28, \ldots$

2. Find the common ratio, *r*, of each geometric sequence

a) $-1, -5, -25, -125, \ldots$

b) $-200, 100, -50, -25, \ldots$

3. Find the next three terms of the following sequence

a) $386561, 55223, 7889, \_\_\_\_, \_\_\_\_, \_\_\_\_$

b) $-\frac{1}{5}, -\frac{1}{15}, -\frac{1}{45}, \_\_\_\_, \_\_\_\_, \_\_\_\_$

4. Find a formula for the nth term of each geometric sequence.

a) $a = 4,\ t_{13} = 16384$

b) $t_3 = 5,\ t_6 = 135$

5. The seventh term of a geometric sequence is 1215 and the fourth term is 45. Find the common ratio, then find the value of the ninth term.

6. A population of rabbits is growing at a rate of 8% a year. If there are 160 rabbits in the initial population, create a general term equation, t_n, describing this sequence. Use it to find the number of rabbits after 6 years.

7. Find the sum of the following geometric series. If necessary, round to 2 decimal places.

a) $729 - 243 + 81 - 27 + \ldots$ (10 terms)

b) $7 + 14 + 28 + 56 + \ldots + 7168$

c) $\sum_{n=4}^{10} 5(2)^n$

8. Find the common ratio of a geometric series with a first term of 38 and a sum to infinity of 76.

9. Find the general term, t_n , for the described sequences:

a) geometric, beginning: $-2, 1, -\frac{1}{2}, \frac{1}{4}, ..$

b) geometric, with $t_3 = 75$ and $r = 5$

c) geometric, with $t_4 = 5$ and $r = \frac{1}{4}$

10. Find the 25th term of the following geometric sequence: $2, 2\sqrt{3}, 6, ...$

11. List the first five terms of the geometric sequence with $t_3 = 8$ and $r = -\frac{1}{2}$.

12. Find the requested sum for each geometric sequence.

a) Find S_{12} correct to 2 decimal places, for $a = 5$, $r = \frac{2}{3}$

b) Find S_9 for $a = -3$ and $r = 2$

c) Find the sum of the first 11 terms of the geometric series that begins $7 - 14 + 28 - ...$

13. Determine the sum, if possible:

a) $\sum_{i=1}^{\infty} -4\left(\frac{4}{5}\right)^i$

b) $\sum_{i=1}^{6} 2(3)^i$

c) $\sum_{i=1}^{\infty} 5\left(\frac{4}{3}\right)^i$

d) $\sum_{i=1}^{\infty} 5\left(\frac{2}{3}\right)^i$

14. A helium balloon rises 80 meters the first minute after it is released. Each minute after that it rises 15% less than the previous minute. How high does the balloon rise in total?