Math 20 Pre-Calculus
Practice Quiz
Geometric Sequences and Series

Name

20.1-2	2	3	4
Outcome 1-2: I can analyze geometric sequences and series to solve problems	I can generate a geometric sequence. I can identify geometric sequences. I can find a, n, r, t_n *or* S_n involving single steps	I can do multistep substitutions. I can determine a, n, r, t_n *or* S_n in easier situational questions.	I can determine a, n, r, t_n *or* S_n in more difficult situational questions. I can answer theoretical questions. No mistakes

Level 2

1. Which sequences could be geometric? If it is, state its common ratio.
   a. 2, 4, 8, …
   b. 6, 3, 0, -3, -6, …
   c. $2, 2\sqrt{2}, 4, 4\sqrt{2}, 8, \ldots, \ldots$
   d. $25, -5, 1, -\frac{1}{5}, \frac{1}{25}$
   e. 0.1, 0.01, 0.001,…
   f. $1, x, x^2, x^3, x^4, \ldots$

2. State the common ratio, then write the next 3 terms:
   a. 6, 12, 24, …
   b. 64, 48, 36,…

3. Write the first five terms of the geometric sequence.

   a. $t_1 = -3,$ and $r = 4$

   b. $t_1 = 243$ and $r = \frac{2}{3}$

4. Find t_{20} for the geometric sequence: 6, 12, 24, 48, ….

5. Find the 18^{th} term for $x, 2x^2, 4x^3, \ldots$

6. The sum of the first 10 terms of a geometric series is -29 524. The common ratio is -3. Determine the first term.

7. Determine S_8 for the geometric series: 3 + 6 + 12 + …

8. This infinite geometric series converges. Determine its sum.
   $6 + 4 + \frac{8}{3} + \ldots$

Level 3

9. Calculate the sum of this geometric series: 6 + 12 + 24 + 48 + … + 12 288

10. Suppose that each year a certain tree grows vertically by 90% as much as it did the year before. If in the first year the tree grew 2.35 m, what is the tallest that the tree will ultimately grow?

11. A culture initially has 5000 bacteria, and the number increases by 8% every hour. How many bacteria are present at the end of 5 hours?

Level 4

12. On Monday, Ian had 3 friends visit his personal profile on a social networking website. On Tuesday, each of these 3 friends had 3 different friends visit Ian's profile. On Wed, each of the 9 friends on Tuesday had 3 different friends visit Ian's profile.
    a. Write the total number of friends who visited Ian's profile as a geometric series. What is the first term? What is the common ratio?

    b. Suppose this pattern continued for 1 week. What is the total number of people who visited Ian's profile? How do you know your answer is correct?

13. Is there an infinite geometric series for which $t_1 = 4$ and $S_\infty = 2$?

14. Solve the equation $1 + x + x^2 + x^3 + x^4 + \ldots = 5$

15. The figure below was made by drawing a square and then subdividing it into 9 smaller squares. The middle square was left white, and the four squares bordering it were shaded black. Each of the remaining four corner squares was then subdivided in the same manner as was the original square. Again this pattern was repeated. The figure shows 3 generations of this process. If the process continues forever, what percent of the original square will be black?