Name _____ Date _____

7.4 Practice B

In Exercises 1 and 2, consider the infinite geometric series. Find the partial sums S_n for $n = 1, 2, 3, 4$, and 5. Then describe what happens to S_n as n increases.

1. $\frac{3}{4} + \frac{1}{4} + \frac{1}{12} + \frac{1}{36} + \frac{1}{108} + \ldots$

2. $6 + 4 + \frac{8}{3} + \frac{16}{9} + \frac{32}{27} + \ldots$

In Exercises 3–6, find the sum of the infinite geometric series, if it exists.

3. $\sum_{n=1}^{\infty} \frac{5}{3}\left(\frac{3}{4}\right)^{n-1}$

4. $\sum_{n=1}^{\infty} \frac{3}{7}\left(\frac{7}{2}\right)^{n-1}$

5. $8 - 10 + \frac{25}{2} - \frac{125}{4} + \ldots$

6. $\frac{1}{5} + \frac{2}{15} + \frac{4}{45} + \frac{8}{135} + \ldots$

7. Describe and correct the error in finding the sum of the infinite geometric series.

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

For this series, $a_1 = \frac{5}{2}$ and $r = \frac{1}{3}$.

$$S = \frac{a_1}{1 - r} = \frac{\frac{5}{2}}{\frac{1}{3}} = \frac{5}{2} \bullet \frac{3}{1} = \frac{15}{2}$$

8. You are going for a 4-mile run. You know that you can run half the distance, and you successfully run 2 miles. There are 2 miles to go, and you know that you can run half that distance. You successfully run that next mile. Now there is 1 mile to go, and you know that you can run half that distance. You successfully run that next half mile. This process continues. Will you cover the 4 miles over the course of your run? Explain your answer.

In Exercises 9–11, write the repeating decimal as a fraction in simplest form.

9. 0.45454545…

10. 0.05050505…

11. 1.4444…

12. A radio station has a daily contest in which a random listener is asked a trivia question. On the first day, the station gives \$300 to the first listener who answers correctly. On each successive day, the winner receives 95% of the winnings from the previous day. What is the total amount of prize money the radio station gives away during the contest?