Chapter 11 Review

Tell whether the sequence is arithmetic, geometric, or neither.

1. $4, 9, 14, 19, 24$
2. $10, 20, 40, 80, 160$
3. $1, 2, 6, 24, 120$

Write the first four terms of the sequence.

4. $a_n = 3n + 2$
5. $a_n = 2n^2 + 1$
6. $a_1 = 3, a_n = 5(a_{n-1})$

Write the next term of the sequence, and then write the explicit rule for the nth term.

7. $15, 17, 19, 21, \dots$
8. $2, 6, 18, 54, \dots$
9. $\frac{1}{3}, \frac{3}{4}, \frac{5}{5}, \frac{7}{6}, \dots$

Find the sum of the series. (Show work.)

10. $$\sum_{i=1}^{100} 2i + 1$$

11. $$\sum_{i=1}^{20} 2\left(\frac{1}{3}\right)^{i-1}$$

12. $$\sum_{i=1}^{3} i^2$$

13. $$\sum_{i=2}^{5} i!$$

14. $$\sum_{i=1}^{\infty} 3\left(\frac{1}{2}\right)^{i-1}$$

Write the repeating decimal as a fraction in lowest terms. (Show work.)

15. $0.583333333\dots$
16. $1.23123123123\dots$

Write a recursive rule for the sequence.

17. $12, 19, 26, 33, 40, \dots$
18. $10, 30, 90, 270, \dots$
19. $3, 4, 7, 11, 18, 29, \dots$

Word Problems.

20. The value of a certain car is 85% of the previous year's value each year. The value of the car after the first year is $15,000. Find the explicit rule for the value of the car after n years. What is the value of the car after the 7th year?
21. A company had a profit of $350,000 in its first year. Since then, the company's profit has decreased by 12% per year. If this trend continues, what is an upper limit on the total profit the company can make over the course of its lifetime?

Answers

1. Arithmetic
2. Geometric
3. Neither
4. $5, 8, 11, 14$
5. $3, 9, 19, 33$
6. $3, 15, 75, 375$
7. $23; a_n = 2n + 13$
8. $162; a_n = 2(3)^{n-1}$
9. $\frac{9}{7}; a_n = \frac{2n-1}{n+2}$
10. 10200
11. 3
12. 14
13. 152
14. 6
15. $\frac{7}{12}$
16. $\frac{410}{333}$
17. $a_1 = 12, a_n = a_{n-1} + 7$
18. $a_1 = 10, a_n = 3a_{n-1}$
19. $a_1 = 3, a_2 = 4, a_n = a_{n-1} + a_{n-2}$
20. $a_n = 15000(0.85)^{n-1}; \$5657.24$
21. $\$2,916,666.67$