Name _____ Class _____ Date _____

Practice 11-1

Mathematical Patterns

Write a recursive formula for each sequence. Then find the next term.

1. $-14, -8, -2, 4, 10, \ldots$

2. $6, 5.7, 5.4, 5.1, 4.8, \ldots$

3. $1, -2, 4, -8, 16, \ldots$

4. $1, 3, 9, 27, \ldots$

5. $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \ldots$

6. $\frac{2}{3}, 1, 1\frac{1}{3}, 1\frac{2}{3}, 2, \ldots$

7. $36, 39, 42, 45, 48, \ldots$

8. $36, 30, 24, 18, 12, \ldots$

9. $9.6, 4.8, 2.4, 1.2, 0.6, \ldots$

Write an explicit formula for each sequence. Then find a_{20}.

10. $7, 14, 21, 28, 35, \ldots$

11. $2, 8, 14, 20, 26, \ldots$

12. $5, 6, 7, 8, 9, \ldots$

13. $-1, 0, 1, 2, 3, \ldots$

14. $3, 5, 7, 9, 11, \ldots$

15. $0.8, 1.6, 2.4, 3.2, 4, \ldots$

16. $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \ldots$

17. $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{1}{10}, \ldots$

18. $\frac{2}{3}, 1\frac{2}{3}, 2\frac{2}{3}, 3\frac{2}{3}, 4\frac{2}{3}, \ldots$

Describe each pattern formed. Find the next three terms.

19. $1, 2, 4, 8, 16, \ldots$

20. $44, 39, 34, 29, 24, \ldots$

21. $0.7, 0.8, 0.9, 1.0, 1.1, \ldots$

22. $4, 11, 18, 25, 32, \ldots$

23. $1\frac{1}{4}, 2\frac{1}{2}, 5, 10, 20, \ldots$

24. $-6, -9, -12, -15, -18, \ldots$

Decide whether each formula is *explicit* or *recursive*. Then find the first five terms of each sequence.

25. $a_n = \frac{1}{3}n$

26. $a_n = n^2 - 6$

27. $a_1 = 5, a_n = 3a_{n-1} - 7$

28. $a_n = \frac{1}{2}(n - 1)$

29. $a_1 = 5, a_n = 3 - a_{n-1}$

30. $a_1 = -4, a_n = 2a_{n-1}$

31. The first figure of a fractal contains one segment. For each successive figure, six segments replace each segment.

- **a.** How many segments are in each of the first four figures of the sequence?
- **b.** Write a recursive formula for the sequence.

32. The sum of the measures of the exterior angles of any polygon is 360. All the angles have the same measure in a regular polygon.

- **a.** Find the measure of one exterior angle in a regular hexagon (six angles).
- **b.** Write an explicit formula for the measure of one exterior angle in a regular polygon with n angles.
- **c.** Why would this formula not be meaningful for $n = 1$ or $n = 2$?