# 3.7 What Comes Next? What Comes Later?
*A Practice Understanding Task*

For each of the following tables,

- describe how to find the next term in the sequence,
- write a recursive rule for the function,
- describe how the features identified in the recursive rule can be used to write an explicit rule for the function, and
- write an explicit rule for the function.
- identify if the function is arithmetic, geometric or neither

*Example*:

| x | y |
|---|---|
| 0 | 5 |
| 1 | 8 |
| 2 | 11 |
| 3 | 14 |
| 4 | ? |
| ... | ... |
| n | ? |

- To find the next term: add 3 to the previous term
- Recursive rule: $f(0) = 5, f(n) = f(n-1) + 3$
- To find the $n^{th}$ term: start with 5 and add 3 $n$ times
- Explicit rule: $f(n) = 5 + 3n$
- Arithmetic, geometric, or neither? Arithmetic

### Function A

| x | y |
|---|---|
| 1 | 5 |
| 2 | 10 |
| 3 | 20 |
| 4 | 40 |
| 5 | ? |
| ... | ... |
| n | ? |

1. To find the next term: _____
2. Recursive rule: _____
3. To find the $n^{th}$ term: _____
4. Explicit rule: _____
5. Arithmetic, geometric, or neither? _____

### Function B

| x | y |
|---|---|
| 0 | 3 |
| 1 | 4 |
| 2 | 7 |
| 3 | 12 |
| 4 | 19 |
| 5 | ? |
| ... | ... |
| n | ? |

6. To find the next term: _____
7. Recursive rule: _____
8. To find the $n^{th}$ term: _____
9. Explicit rule: _____
10. Arithmetic, geometric, or neither? _____

© 2012 Mathematics Vision Project | M**V**P

In partnership with the Utah State Office of Education

Licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported license.

Sequences 25

| x | y |
|---|---|
| 1 | 3 |
| 2 | 5 |
| 3 | 9 |
| 4 | 17 |
| 5 | 33 |
| 6 | ? |
| … | … |
| n | ? |

### Function C

11. To find the next term: _____

12. Recursive rule: _____

13. To find the $n^{th}$ term: _____

14. Explicit rule: _____

15. Arithmetic, geometric, or neither? _____

| x | y |
|---|---|
| 1 | -8 |
| 2 | -17 |
| 3 | -26 |
| 4 | -35 |
| 5 | -44 |
| 6 | -53 |
| … | … |
| n | |

### Function D

16. To find the next term: _____

17. Recursive rule: _____

18. To find the $n^{th}$ term: _____

19. Explicit rule: _____

20. Arithmetic, geometric, or neither? _____

| x | y |
|---|---|
| 1 | 2 |
| 2 | -6 |
| 3 | 18 |
| 4 | -54 |
| 5 | 162 |
| 6 | -486 |
| … | … |
| n | |

### Function E

21. To find the next term: _____

22. Recursive rule: _____

23. To find the $n^{th}$ term: _____

24. Explicit rule: _____

25. Arithmetic, geometric, or neither? _____

| x | y |
|---|---|
| 0 | 1 |
| 1 | $1\frac{3}{5}$ |
| 2 | $2\frac{1}{5}$ |
| 3 | $2\frac{4}{5}$ |
| 4 | $3\frac{2}{5}$ |
| 5 | 4 |
| … | … |
| n | |

### Function F

26. To find the next term: _____

27. Recursive rule: _____

28. To find the $n^{th}$ term: _____

29. Explicit rule: _____

30. Arithmetic, geometric, or neither? _____

| x | y |
|---|---|
| 1 | 10 |
| 2 | 2 |
| 3 | $\dfrac{2}{5}$ |
| 4 | $\dfrac{2}{25}$ |
| 5 | $\dfrac{2}{125}$ |
| 6 | $\dfrac{2}{625}$ |
| ... | ... |
| n | |

### Function G

31. To find the next term: _____

32. Recursive rule: _____

33. To find the $n^{th}$ term: _____

34. Explicit rule: _____

35. Arithmetic, geometric, or neither? _____

| x | y |
|---|---|
| 1 | -1 |
| 2 | 0.2 |
| 3 | -0.04 |
| 4 | 0.008 |
| 5 | -0.0016 |
| 6 | 0.00032 |
| ... | ... |
| n | |

### Function H

36. To find the next term: _____

37. Recursive rule: _____

38. To find the $n^{th}$ term: _____

39. Explicit rule: _____

40. Arithmetic, geometric, or neither? _____