

# What Comes Next? What Comes Later?

## A Practice Understanding Task



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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  $n^{\text{th}}$  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  $n^{\text{th}}$  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  $n^{\text{th}}$  term: \_\_\_\_\_
9. Explicit rule: \_\_\_\_\_
10. Arithmetic, geometric, or neither? \_\_\_\_\_



### Function C

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

11. To find the next term: \_\_\_\_\_
12. Recursive rule: \_\_\_\_\_
13. To find the  $n^{\text{th}}$  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  $n^{\text{th}}$  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  $n^{\text{th}}$  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  $n^{\text{th}}$  term: \_\_\_\_\_
29. Explicit rule: \_\_\_\_\_
30. Arithmetic, geometric, or neither? \_\_\_\_\_



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

### Function G

31. To find the next term: \_\_\_\_\_
32. Recursive rule: \_\_\_\_\_
33. To find the  $n^{\text{th}}$  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  $n^{\text{th}}$  term: \_\_\_\_\_
39. Explicit rule: \_\_\_\_\_
40. Arithmetic, geometric, or neither? \_\_\_\_\_

