

For each sequence, state if it is arithmetic, geometric, or neither. If it is arithmetic, tell the common difference. If it is geometric, tell the common ratio. If it is neither, chill out and move on to the next problem.

1) $-7, -5, -2, 2, 7, \dots$

2) $9, 11, 13, 15, 17, \dots$

3) $4, 12, 36, 108, 324, \dots$

4) $7, 9, 12, 16, 21, \dots$

5) $4, 16, 64, 256, 1024, \dots$

6) $-3, 6, -12, 24, -48, \dots$

7) $a_n = -(-2)^{n-1}$

8) $a_n = -\frac{5}{n+2}$

9) $a_n = -25 + 2n$

10) $a_n = 41 - 8n$

Determine if the sequence is arithmetic. If it is, find the common difference, the term named in the problem, and the explicit formula.

11) $-11, -1, 9, 19, \dots$
Find a_{20}

12) $40, 30, 20, 10, \dots$
Find a_{37}

13) 6, -194, -394, -594, ...
Find a_{37}

Determine if the sequence is geometric. If it is, find the common ratio, the term named in the problem, and the explicit formula.

14) -3, -9, -27, -81, ...
Find a_{10}

15) 2, -1, -4, -7, ...
Find a_{12}

16) 3, -12, 48, -192, ...
Find a_{10}

For numbers 16 – 20, find the sum of the first n terms indicated in part (a). Then, for part (b), find n for the given sum S_n .

17. $1 + 4 + 16 + 64 + \dots$

- a. *Sum of the first 10 terms?*
b. For which term would $S_n = 89,478,485$?

18. $50 + 42 + 34 + 26 + \dots$

- a. *Sum of the first 13 terms?*
b. For which term would $S_n = -1150$?

19. $0.001 + 0.01 + 0.1 + 1 + \dots$

- a. *Sum of the first 10 terms?*
b. For which term would $S_n = 111111111.111$?

20. $-75 - 67 - 59 - 51 - 43 \dots$

- a. *Sum of the first 24 terms?*
b. For which term would $S_n = 20$?

Answers to CA 14.2

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|--|----------------------------|---|---|---|--------------|--------------|
| 1) Neither | 2) Arithmetic | 3) Geometric | 4) Neither | 5) Geometric | 6) Geometric | 7) Geometric |
| 8) Neither | 9) Arithmetic | 10) Arithmetic | 11) Common Difference: $d = 10$ $a_{20} = 179$
Explicit: $a_n = -21 + 10n$ | 12) Common Difference: $d = -10$ $a_{37} = -320$
Explicit: $a_n = 50 - 10n$ | | |
| 13) Common Difference: $d = -200$ $a_{37} = -7194$
Explicit: $a_n = 206 - 200n$ | | 14) Common Ratio: $r = 3$ $a_{10} = -59049$
Explicit: $a_n = -3 \cdot 3^{n-1}$ | 15) Not geometric | 16) Common Ratio: $r = -4$ $a_{10} = -786432$
Explicit: $a_n = 3 \cdot (-4)^{n-1}$ | | |
| 17a. 349525
b. $n = 14$ | 18a. 349525
b. $n = 25$ | 19a. 1,111,111.111
b. $n = 12$ | 20 a. 408
b. $n = 20$ | | | |