Name

Period 6.3 Geometric sequences in Recursive Form Date.

Write the recursive definition for each geometric sequence.

Recursive formula

$A(n) = A(n-1) \cdot r$

1) 4, 12, 36, 108 (×3, ×3)

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot 3 \quad A(1) = 4$

2) 6, 9, 13.5, 20.25 (×1.5, ×1.5)

$A(n) = A(n-1) \cdot 1.5 \quad A(1) = 6$

3) 0.1, 0.5, 2.5, 12.5 (×5, ×5, ×5)

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot 5 \quad A(1) = 0.1$

4) $40, 10, \frac{5}{2}, \frac{5}{8}$ ($\times\frac{1}{4}$, $\times\frac{1}{4}$)

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot \left(\frac{1}{4}\right) \quad A(1) = 40$

5) 1, −4, 16, −64 (×−4)

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot (-4) \quad A(1) = 1$

6) 25, 50, 100, 200

$A(n) = A(n-1) \cdot 1$

$A(n) = A(n-1) \cdot (2)$ $\quad A(1) = 25$

Find the common ratio for each geometric sequence.

7) 1, 6, 36, 216 (×6, ×6, ×6)

[6]

8) 10, 100, 1000, 10,000

[10]

9) $-2, 4, -8, 16$ (×−2, ×−2)

(−2)

10) 9, 27, 81, 243 (×3, ×3, ×3)

[3]

11) 128, 64, 32, 16 (×½, ×½)

$\left(\frac{1}{2}\right)$

12) $-3, \overset{\times 2}{-6}, -12, -24$

$\boxed{2}$

13) $2, \overset{\times -3}{-6}, \overset{\times -3}{18}, -54$

$\boxed{-3}$

14) $7, \overset{\times 8}{56}, 448, 3,584$

$\boxed{8}$

Write the recursive definition for each geometric sequence.

15) $5, 15, 45, 135$

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot 3 \quad A(1) = 5$

16) $-2, \overset{\times 6}{-12}, -72, -432$

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot 6 \quad A(1) = -2$

17) $500, \overset{\times \frac{1}{5}}{100}, 20, 4$

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot \frac{1}{5} \quad A(1) = 500$

18) $75, 15, 3, \frac{3}{5}$

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot \frac{1}{5}$ $A(1) = 75$

19) $45, 90, 180, 360$ (×2, ×2)

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot 2$ $A(1) = 45$

20) $2, 2, 2, 2$

$A(n) = A(n-1) \cdot r$

$A(n) = A(n-1) \cdot 1$ $A(1) = 2$

Find the indicated term of the geometric sequence.

21.) $A(n) = -4 \cdot A(n-1)$; where $A(1) = 5$; $A(6)$

$A(n) = A(n-1)(-4)$

~~1, 3, 7, 11, 15~~

$\times -4$ $\times -4$

5, -20, 80, -320, 1280, -5,120 ✓

26) $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ (÷2)

No

27) $3, -3, 3, -3$ (×−1)

$A(n) = A(n-1) \cdot r$

yes $A(1) = 3$ $A(n) = A(n-1)(-1)$

28) $25, 50, 100, 200$

yes

$A(n) = A(n-1) \cdot r$

$A(1) = 25$

$A(n) = A(n-1)(2)$

Identify each sequence as arithmetic, geometric or neither.

24) $5, 6, 8, 11$ (+1, +2, +3) neither

30) $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}$ (×½) geometric

31) $1, 4, 7, 10$ (+3, +3, +3) Arithmetic

32) $-5, 30, -180, 1080$ (×−6, ×−6) geometric

22) $A(n) = A(n-1)(2)$ where $A(1) = 7$ $A(10)$

$\overset{\times 2}{}$

7, 14, 28, 56, 112, 224, 448, 896, 1792, 3,584

23) $A(n) = \left(-\frac{1}{2}\right) \cdot A(n-1)$ where $A(1) = 1024$ $A(9)$

$(-\frac{1}{2})$

1024, −512, 256, −128, 64, −32, 16, −8, 4

24) $A(n) = -3 \cdot A(n-1)$ where $A(1) = 45$; $A(7)$

$\overset{-3}{}$

~~45, −135, 405, −1215, 3645, −10,935, 32,805~~

45, −135, 405, −1215, 3645, −10,935, 32,805

Determine if each sequence is a geometric sequence. If it is find the common ratio and write a recursive definition

$\overset{\times 8.33 \times 2}{}$

25) 3, 25, 50, 75, 100

NO