

Name: Key

Period: _____

Using Explicit Formulas of Sequences

Determine whether the following sequences are arithmetic, geometric, or neither. If arithmetic, find the common difference. If geometric, find the common ratio. If neither, explain why.

1. 6, 24, 96, 384, ...

Geometric $r=4$

2. 1, 3, 7, 13, ...

3. 4, 13, 22, 31, ...

a $d=9$

4. 3, -1, -5, -9, ...

5. -11, -7, -3, 1, ...

a , $d=4$

6. $\frac{1}{2}, \frac{3}{2}, \frac{9}{2}, \frac{27}{2}, \dots$

7. $\frac{1}{3}, \frac{2}{3}, 1, \frac{4}{3}, \dots$

a , $d=\frac{1}{3}$

8. $-\frac{3}{4}, \frac{1}{8}, -\frac{1}{16}, \frac{3}{32}, \dots$

9. $\frac{3}{5}, \frac{4}{25}, \frac{5}{125}, \frac{6}{625}, \dots$

neither

10. 36, 49, 64, 81, ...

Write the first six terms of the sequence.

11. $a_n = n + 1$

2, 3, 4, 5, 6, 7

12. $a_n = 2n + 5$

13. $a_n = \frac{1}{5}n - 7$

-6.8, -6.6, -6.4,

-6.2, -6, -5.8

14. $a_n = 3 - n$

15. $a_n = n^2$

1, 4, 9, 16, 25, 36

16. $a_n = \frac{n}{n+1}$

17. Is the formula in problem 15 for an arithmetic or geometric sequence? Or neither? How do you know?

Neither, not x or +

18. Is the formula in problem 16 for an arithmetic or geometric sequence? Or neither? How do you know?

Neither

Find the explicit formula for the arithmetic sequence represented in the given information.

19. 1, 3, 5, 7, ...

E: $a_n = 2n - 1$

R: $a_n = a_{n-1} + 2; a_1 = 1$

20. common difference: -8
initial value: 3

21. 6, 14, 22, 30, ...

E: $a_n = 8n - 2$

R: $a_n = a_{n-1} + 8; a_1 = 6$

22. 9, 23, 37, 51, ...

23. common difference: $\frac{1}{4}$
2nd term: 9

E: $a_n = \frac{1}{4}n + 8.5$

R: $a_n = a_{n-1} + \frac{1}{4}; a_1 = 8.75$

24. 1.6, 4, 6.4, 8.8, ...

Write the first six terms of the sequence.

25. $a_n = -2(5)^{n-1}$

-2, -10, -50, -250, -1250, -6250

26. $a_n = 400 \left(\frac{1}{6}\right)^n$

27. $a_n = 12(-3)^n$

-36, 108, -324,
972, -2916, 8748

28. $a_n = 8 \left(\frac{2}{3}\right)^{n-1}$

Find the explicit formula for the geometric sequence represented in the given information.

29. 1, -4, 16, -64, ...

E: $a_n = (-4)^{n-1}$
 R: $a_n = 4a_{n-1}$; $a_1 = 1$

30. 2, 14, 98, 686, ...

31. $5, -\frac{5}{3}, \frac{5}{9}, -\frac{5}{27}, \dots$

E: $a_n = 5(-\frac{1}{3})^{n-1}$
 R: $a_n = -\frac{1}{3}a_{n-1}$; $a_1 = -5$

32. common ratio: 2
 initial value: 12

33. common ratio: 3

2nd term: 6

E: $a_n = 2(3)^{n-1}$
 R: $a_n = 3a_{n-1}$; $a_1 = 2$

34. $2, \frac{4}{3}, \frac{8}{9}, \frac{16}{27}, \dots$

Find the missing terms of each arithmetic sequence.

35. -20, 15, -10

36. -13, 187, 387

37. -26, -22, -18, -14, -10

38. 38, 30, 22, 14

Find the missing terms of each geometric sequence.

39. 4, 8, 16

40. 4, 20, 100

41. -1, 6, -36, 216

42. 2, 6, 18, 54, 162

Find the explicit formula for each of the following.

43. common difference: 10
25th term: 222

$$E: a_n = 10n - 28$$

$$R: a_n = a_{n-1} + 10; a_1 = -18$$

45. common ratio: 2
11th term: -1024

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

$$R: a_n = 2a_{n-1}; a_1 = -1$$

47. common difference: 4
 $a_{24} = 92$

$$E: a_n = 4n - 4$$

$$R: a_n = a_{n-1} + 4; a_1 = 0$$

49. Arithmetic sequence where
8th term is 8, 20th term is 44

$$E: a_n = 3n - 16$$

$$R: a_n = a_{n-1} + 3; a_1 = -13$$

51. Geometric sequence where
 $a_3 = 16$ and $a_6 = 128$

$$E: a_n = 4(2)^{n-1}$$

$$a_n = 2a_{n-1}; a_1 = 4$$

44. common difference: 8
33rd term: 247

46. common ratio: -3
9th term: 6561

48. common ratio: 6
 $a_8 = 279936$

50. Geometric sequence where
1st term is 4, 4th term is 108

$$a_n = 4(3)^{n-1}$$

52. Arithmetic sequence where
 $a_9 = -5$ and $a_{15} = 31$

$$a_n = 6n - 59$$

odd

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or sequences are arithmetic, geometric, or neither. If arithmetic, find

1
0

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