

11.1-11.3: Sequences and Series Review

Find the first four terms in each sequence.

1) $a_n = 8 + 4n$

$$12, 16, 20, 24$$

2) $a_n = -7 + 3n$

$$-4, -1, 2, 5$$

3) $a_n = -7 + 30n$

$$23, 53, 83, 113$$

4) $a_n = -50 + 20n$

Write the formula for each sequence.

5) $\frac{2}{3}, \frac{4}{5}, \frac{6}{7}, \frac{8}{9}, \frac{10}{11}, \dots$

6) 4, 7, 12, 19, 28, ...

7) 4, 16, 36, 64, 100, ...

8) 2, 5, 10, 17, 26, ...

For each sequence, state if it is arithmetic, geometric, or neither.

9) 10.1, 10.7, 11.3, 11.9, 12.5, ...

A

10) -34, -4, 26, 56, 86, ...

A

11) 4, 16, 36, 64, 100, ...

N

12) -4, -12, -36, -108, -324, ...

G

13) -3, -9, -27, -81, -243, ...

G

14) 1, 9, 25, 49, 81, ...

N

Rewrite each series using sigma notation. (Sum)

15) $1 + 2 + 3 + 4 + 5 + 6$

$$\sum_{k=1}^6 k$$

16) $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$

$$\sum_{m=1}^5 \frac{1}{m}$$

17) $4 + 8 + 12 + 16$

$$\sum_{k=1}^4 4k$$

18) $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6}$

$$\sum_{n=1}^5 \frac{n}{n+1}$$

What are first 5 terms

$$19) \sum_{k=1}^6 k(k-2)$$

1(1-2)	2(2-2)
1(-1)	2(0)
3(3-2)	4(4-2)
3(-1)	4(2)
-1, 0, 3, 8, 15	5(5-2)
	5(3)

$$21) \sum_{m=1}^5 (m+200)$$

$$22) \sum_{n=1}^5 3n$$

201, 202, 203, 204, 205 3, 6, 9, 12, 15

Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, and the explicit formula.

$$23) 3, -6, 12, -24, \dots$$

No

$$24) -22, -26, -30, -34, \dots \quad d = -4$$

$$a_{52} = -22 + (52-1)(-4)$$

$$= -22 + (51)(-4)$$

$$\dots = -22 + \dots -204$$

$$= \underline{\underline{-226}}$$

$$a_n = a_1 + (n-1)d$$

$$= -22 + (n-1)(-4)$$

Given the first term and the common difference of an arithmetic sequence find the 52nd term and the explicit formula.

$$25) a_1 = -12, d = -9$$

$$a_n = -12 + (n-1)(-9)$$

$$a_{52} = -12 + (51)(-9)$$

$$= -12 + -459$$

$$= \boxed{-471}$$

$$26) a_1 = -36, d = 7$$

$$a_n = -36 + (n-1)(7)$$

$$a_{52} = -36 + 51(7)$$

$$= -36 + 357$$

$$= \boxed{321}$$

Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, and the formula.

$$27) 10, 12, 15, 19, \dots$$

No

$$28) -2, 12, -72, 432, \dots$$

$$r = -6$$

$$a_8 = -2 \cdot -6^{8-1}$$

$$= -2 \cdot -6^7$$

$$= 559872$$

$$a_n = -2 \cdot -6^{n-1}$$

Given the first term and the common ratio of a geometric sequence find the 8th term and the formula.

$$29) a_1 = -1, r = -5$$

$$a_8 = -1 \cdot -5^{8-1}$$

$$= -1 \cdot -5^7$$

$$= 78125$$

$$a_n = a_1 \cdot -5^{n-1}$$

Given a term in a geometric sequence and the common ratio find the 8th term and the formula.

30) $a_1 = -1, r = -3$

$$a_n = a_1 \cdot r^{n-1}$$

$$a_8 = -1 \cdot (-3)^7$$

$$\therefore \approx 2187$$

30) $a_4 = -27, r = 3$

$$a_n = a_1 \cdot r^{n-1}$$

$$a_8 = -1 \cdot 3^{8-1} \\ = -2187$$

$$\begin{aligned} -27 &= a_1 \cdot 3^{4-1} \\ -27 &= \frac{a_1 \cdot 27}{27} \\ -1 &= a_1 \end{aligned}$$

Given two terms in a geometric sequence find the common ratio, the 8th term, and the formula.

30) $a_6 = -12500$ and $a_5 = -2500$

$$-12500 = a_1 \cdot r^5$$

$$-2500 = a_1 \cdot r^4$$

$$r = 5$$

$$a_8 = -312500$$

$$a_n = -5^{n-1}$$

Find each geometric series described.

$$10, -20, 40, \dots$$

7. $\sum_{i=1}^7 i^2$

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7. $\sum_{n=1}^m n^2$

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