

Unit Review of Sequences and Series

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

1) $-24, -27, -30, -33, \dots$

Find the Common Difference:

Recursive :

Explicit:

a_{24}

2) $15, 45, 75, 105, \dots$

Find the Common Difference:

Recursive :

Explicit:

a_{28}

Given the recursive formula for an arithmetic sequence find the common difference, the term named in the problem, and the explicit formula.

3) $a_n = a_{n-1} - 10$

$a_1 = 23$

Find the Common Difference:

Explicit:

a_{39}

Given the explicit formula for an arithmetic sequence find the common difference and the recursive formula.

4) $a_n = -35 + (n - 1) \cdot -10$

Common difference:

Recursive:

Evaluate the related series of each sequence.

5) $-4, 0, 4, 8, 12, 16, 20$

Evaluate each arithmetic series described.

6) $20 + 27 + 34 + 41 \dots, n = 12$

7) $\sum_{k=1}^{10} (7k - 6)$

8) $\sum_{i=1}^{40} (4i - 8)$

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

9) $-2, -6, -18, -54, \dots$
Find the common Ratio:
Recursive:

Explicit:

$$a_9$$

10) $4, 12, 36, 108, \dots$
Find the common Ratio:
Recursive:

Explicit:

$$a_9$$

Given the recursive formula for a geometric sequence find the common ratio, the term named in the problem, and the explicit formula.

11) $a_n = a_{n-1} \cdot -2$
 $a_1 = -2$
Find the common Ratio:

Explicit:

$$a_9$$

Given the explicit formula for a geometric sequence find the common ratio, the term named in the problem, and the recursive formula.

12) $a_n = 4 \cdot (-2)^{n-1}$
Find the common Ratio:
Recursive:

$$a_{11}$$

Evaluate each geometric series described.

13) $-1 - 6 - 36 - 216\dots, n = 7$

Evaluate the related series of each sequence.

14) $1, 2, 4, 8, 16$

Determine if each geometric series converges or diverges.

15) $2 + \frac{2}{3} + \frac{2}{9} + \frac{2}{27}\dots$

16) $3 - 9 + 27 - 81\dots$

Evaluate each geometric series described.

17) $\sum_{k=1}^7 5^{k-1}$

18) $\sum_{i=1}^7 (-6)^{i-1}$

Evaluate each infinite geometric series described.

19) $-3 + 1.8 - 1.08 + 0.648 \dots$

20) $-160 - 80 - 40 - 20 \dots$

21) A grocery store display of soup cans has sixteen rows with each row having one less can than the row below it. If the bottom row has twenty-eight cans, how many cans are in the display?

22) The front row of a theater has 25 seats. Each of the rows behind it has two more seats than the row before it. How many total seats are there in the first 20 rows?

23) You have won contest sponsored by a local radio station. If you are given the choice of the two payment plans listed below, which plan will pay you more? How much more?
A) \$1 on the first day, \$2 on the second day, \$3 on the third day, etc., for two weeks.
B) \$0.01 on the first day, \$0.02 on the second day, \$0.04 on the third day, etc. for two weeks.

- 24) The income of Anny's family in 2008 is \$65000. From 2008 to 2011, the income of the family increased by 20% per year. What's the total amount of income of Anny's family from 2008 to 2011? Round your answer to the nearest whole number
- 25) Lee earned \$240 in the first week, \$350 in the second week and \$460 in the third week, and so on in an arithmetic sequence. How much did he earn in the first 5 weeks?
- 26) A new website got 4000 page views on the first day. During the next 4 days, the number of page views increased by 30% per day. What's the total amount of page views in the first 5 days? Round your answer to the nearest whole number
- 27) A truck transport 600 kg of vegetable to the market on Monday. From Monday to Sunday, the amount of vegetable the truck transport increased by 15% per day. What's the total amount of vegetable the truck transport in a week? Round your answer to the nearest whole number

Unit Review of Sequences and Series

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

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|--------------------------------|---|-----------------------------|--|
| 1) $-24, -27, -30, -33, \dots$ | Common Difference: $d = -3$ | 2) $15, 45, 75, 105, \dots$ | Common Difference: $d = 30$ |
| Find the Common Difference: | $a_{24} = -93$ | Find the Common Difference: | $a_{28} = 825$ |
| Recursive : | Explicit: $a_n = -24 + (n - 1) \cdot -3$ | Recursive : | Explicit: $a_n = 15 + (n - 1) \cdot 30$ |
| Explicit: | Recursive: $a_n = a_{n-1} - 3$ | Explicit: | Recursive: $a_n = a_{n-1} + 30$ |
| a_{24} | $a_1 = -24$ | a_{28} | $a_1 = 15$ |

Given the recursive formula for an arithmetic sequence find the common difference, the term named in the problem, and the explicit formula.

- 3) $a_n = a_{n-1} - 10$ **Common Difference:** $d = -10$
 $a_1 = 23$ $a_{39} = -357$
 Find the Common Difference: **Explicit:** $a_n = 33 - 10n$
 Explicit:
 a_{39}

Given the explicit formula for an arithmetic sequence find the common difference and the recursive formula.

- 4) $a_n = -35 + (n - 1) \cdot -10$
 Common difference:
 Recursive:
Common Difference: $d = -10$
Recursive: $a_n = a_{n-1} - 10$
 $a_1 = -35$

Evaluate the related series of each sequence.

- 5) $-4, 0, 4, 8, 12, 16, 20$
56

Evaluate each arithmetic series described.

- 6) $20 + 27 + 34 + 41 \dots, n = 12$
702

7) $\sum_{k=1}^{10} (7k - 6)$
325

- 8) $\sum_{i=1}^{40} (4i - 8)$
2960

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

- | | | | |
|---|---|--|--|
| <p>9) $-2, -6, -18, -54, \dots$</p> <p>Find the common Ratio:</p> <p>Recursive:</p> <p>Explicit:</p> <p>a_9</p> | <p>Common Ratio: $r = 3$</p> <p>$a_9 = -13122$</p> <p>Explicit: $a_n = -2 \cdot 3^{n-1}$</p> <p>Recursive: $a_n = a_{n-1} \cdot 3$</p> <p>$a_1 = -2$</p> | <p>10) $4, 12, 36, 108, \dots$</p> <p>Find the common Ratio:</p> <p>Recursive:</p> <p>Explicit:</p> <p>a_9</p> | <p>Common Ratio: $r = 3$</p> <p>$a_9 = 26244$</p> <p>Explicit: $a_n = 4 \cdot 3^{n-1}$</p> <p>Recursive: $a_n = a_{n-1} \cdot 3$</p> <p>$a_1 = 4$</p> |
|---|---|--|--|

Given the recursive formula for a geometric sequence find the common ratio, the term named in the problem, and the explicit formula.

- 11) $a_n = a_{n-1} \cdot -2$ Common Ratio: $r = -2$
 $a_1 = -2$ $a_9 = -512$
 Find the common Ratio: Explicit: $a_n = -2 \cdot (-2)^{n-1}$
- Explicit:
- a_9

Given the explicit formula for a geometric sequence find the common ratio, the term named in the problem, and the recursive formula.

- 12) $a_n = 4 \cdot (-2)^{n-1}$ Common Ratio: $r = -2$
 Find the common Ratio: $a_{11} = 4096$
 Recursive: Recursive: $a_n = a_{n-1} \cdot -2$
 a_{11} $a_1 = 4$

Evaluate each geometric series described.

- 13) $-1 - 6 - 36 - 216 \dots, n = 7$
 -55987

Evaluate the related series of each sequence.

- 14) $1, 2, 4, 8, 16$
 31

Determine if each geometric series converges or diverges.

- | | |
|---|---|
| <p>15) $2 + \frac{2}{3} + \frac{2}{9} + \frac{2}{27} \dots$</p> <p>Converges</p> | <p>16) $3 - 9 + 27 - 81 \dots$</p> <p>Diverges</p> |
|---|---|

Evaluate each geometric series described.

$$17) \sum_{k=1}^7 5^{k-1}$$

19531

$$18) \sum_{i=1}^7 (-6)^{i-1}$$

39991

Evaluate each infinite geometric series described.

$$19) -3 + 1.8 - 1.08 + 0.648 \dots$$

-1.875

$$20) -160 - 80 - 40 - 20 \dots$$

-320

21) A grocery store display of soup cans has sixteen rows with each row having one less can than the row below it. If the bottom row has twenty-eight cans, how many cans are in the display?

328

22) The front row of a theater has 25 seats. Each of the rows behind it has two more seats than the row before it. How many total seats are there in the first 20 rows?

880

23) You have won contest sponsored by a local radio station. If you are given the choice of the two payment plans listed below, which plan will pay you more? How much more?

A) \$1 on the first day, \$2 on the second day, \$3 on the third day, etc., for two weeks.

B) \$0.01 on the first day, \$0.02 on the second day, \$0.04 on the third day, etc. for two weeks.

Plan A - \$105.00

Plan B - \$163.83

Plan B is \$58.83 better than Plan A

24) The income of Anny's family in 2008 is \$65000. From 2008 to 2011, the income of the family increased by 20% per year. What's the total amount of income of Anny's family from 2008 to 2011? Round your answer to the nearest whole number

\$236,600

25) Lee earned \$240 in the first week, \$350 in the second week and \$460 in the third week, and so on in an arithmetic sequence. How much did he earn in the first 5 weeks?

2300

26) A new website got 4000 page views on the first day. During the next 4 days, the number of page views increased by 30% per day. What's the total amount of page views in the first 5 days? Round your answer to the nearest whole number

36172

27) A truck transport 600 kg of vegetable to the market on Monday. From Monday to Sunday, the amount of vegetable the truck transport increased by 15% per day. What's the total amount of vegetable the truck transport in a week? Round your answer to the nearest whole number

6640 kg