1-4 Additional Practice

Arithmetic Sequences and Series

Are the following sequences arithmetic? If so, what is the common difference? What is the next term in the sequence?

1. 0, –3, –6, –9….

2. 2, 3, 5, 8, ….

3. 127, 140, 153, 166….

Translate between the recursive and explicit definitions for each sequence.

4. $a_n \begin{cases} 6, n = 1 \\ a_{n-1} + 3, n > 1 \end{cases}$

5. $a_n = 12 - 2(n - 1)$

6. $a_n = 5 - 4(n - 1)$

7. Each year, a volunteer organization expects to add 5 more people for whom the group provides home maintenance services. This year, the organization provides the service for 32 people.

a. Write an explicit formula for the number of people the organization expects to serve each year.

b. How many people would the organization expect to serve during the year, 20 years from now?

Find the sum of an arithmetic series with the given number of terms, a_1 and a_n.

8. 9 terms; 2, 5, 8, 11….

9. 12 terms; –2, 2, 6, 10,….

10. 20 terms; 5, 10, 15, 20, ….

Find the sum of each of the following series.

11. $\sum_{n=2}^{5} (5n + 3)$

12. $\sum_{n=1}^{4} (2n + 0.5)$

13. $\sum_{n=1}^{4} (-n - 3)$

14. A marching band formation consists of 6 rows. The first row has 9 musicians, the second has 11, the third has 13 and so on. How many musicians are in the last row and how many musicians are there in all?

15. A student identifies the series 10, 15, 20, 25, 30 as an infinite arithmetic series. Is he correct? Explain.

1-4 Additional Practice

Arithmetic Sequences and Series

Are the following sequences arithmetic? If so, what is the common difference? What is the next term in the sequence?

1. 0, −3, −6, −9….

Yes; −3, −12

2. 2, 3, 5, 8, ….

No.

3. 127, 140, 153, 166….

Yes. 13, 179

Translate between the recursive and explicit definitions for each sequence.

4. $a_n \begin{cases} 6, n = 1 \\ a_{n-1} + 3, n > 1 \end{cases}$

$a_n = 6 + 3(n - 1)$

5. $a_n = 12 - 2(n - 1)$

$a_n = \begin{cases} 12, n = 1 \\ a_{n-1} - 2, n > 1 \end{cases}$

6. $a_n = 5 - 4(n - 1)$

$a_n = \begin{cases} 5, n = 1 \\ a_{n-1} - 4, n > 1 \end{cases}$

7. Each year, a volunteer organization expects to add 5 more people for whom the group provides home maintenance services. This year, the organization provides the service for 32 people.

a. Write an explicit formula for the number of people the organization expects to serve each year. **$a_n = a_{n-1} + 5$, where $a_1 = 32$**

b. How many people would the organization expect to serve during the year, 20 years from now? **127 people**

Find the sum of an arithmetic series with the given number of terms, a_1 and a_n.

8. 9 terms; 2, 5, 8, 11….

126

9. 12 terms; −2, 2, 6, 10,….

240

10. 20 terms; 5, 10, 15, 20, ….

1,050

Find the sum of each of the following series.

11. $\sum_{n=2}^{5} (5n + 3)$

82

12. $\sum_{n=1}^{4} (2n + 0.5)$

22

13. $\sum_{n=1}^{4} (-n - 3)$

−22

14. A marching band formation consists of 6 rows. The first row has 9 musicians, the second has 11, the third has 13 and so on. How many musicians are in the last row and how many musicians are there in all? **19 musicians; 84 musicians**

15. A student identifies the series 10, 15, 20, 25, 30 as an infinite arithmetic series. Is he correct? Explain. **Sample answer: No, the series is a finite arithmetic series. An infinite arithmetic series would continue indefinitely and have an ellipsis, or "…", at the end of the series, which indicates the series goes on infinitely. There is no ellipsis at the end of this series.**