Arithmetic Sequences Assignment

1. For the following arithmetic sequences, **determine the common difference** and **find the next three terms of the sequence**.

   (a) $8, 14, 20, ...$

   (b) $-5, 7, 19, ...$

   (c) $70, 53, 36, 19, ...$

   (d) $7.1, 4.2, 1.3, ...$

   (e) $\frac{2}{3}, \frac{1}{15}, \frac{-8}{15}, ...$

   (f) $-2x + 3y, 5x + y, -8x - y, ...$

2. In each of the following sequences, the value of one term is given. Write the missing terms of the sequence if the common difference is as indicated.

   (a) $\_\_\_\_\_, \_\_\_\_\_, 0, \_\_\_\_\_, \_\_\_\_\_ : d = 3$

   (b) $\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, -3, \_\_\_\_\_ : d = -7$

   (c) $\_\_\_\_\_, \_\_\_\_\_, 1, \_\_\_\_\_, \_\_\_\_\_ : d = -2$

   (d) $\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 15 : d = 2.5$

3. Calculate the first four terms of the arithmetic sequences with the given term and common difference, d.

   (a) $t_1 = 5, d = 6$ (b) $t_3 = 15, d = -2$ (c) $t_5 = 20, d = -1$

4. Consider the sequence $12, 5, -2, -9, ...$
   (a) Determine the formula for the general term of the sequence.

   (b) Determine the nineteenth term of the sequence.

   (c) Which of the numbers -268 and -350 are terms of the sequence?

5. Determine the indicated terms in each arithmetic sequence.
   (a) $-1, -4, -7, -10, ...t_5, t_{24}, t_n$

   (b) $-21, -6, 9, 24, ...t_{10}, t_{90}, t_n$

   (c) $-b, 2a - b, 4a - b, 6a - b, ...t_{12}, t_n$

6. Determine the number of terms in each sequence.
   (a) $4, 7, 10, ..., 49$

(b) $-52, -56, -60, ..., -148$

7. How many multiples of 5 are there from 25 to 315, inclusive?

8. Consider the sequence of multiples of 7 between 51 and 275.
   (a) State the first and last terms of the sequence.

   (b) How many multiples of 7 are there between 51 and 275?

9. How many multiples of 12 are there between 179 and 892?

10. (a) Place five arithmetic means between 20 and -76

    (b) Determine the $4^{th}, 5^{th}, 6^{th}$, and 7^{th} terms of the arithmetic sequence in which $t_3 = -24$ and $t_8 = -94$.

11. The terms $2x + 3, 3x + 1$, and $8x - 1$ are consecutive terms in an arithmetic sequence. Calculate the value of x and state the three terms.

12. The terms $x + 3, 3x - 1$, and $7x - 2$ are consecutive terms in an arithmetic sequence. Calculate the value of x and determine the general term of the sequence.

13. In an arithmetic sequence, the seventh term is 3 and the sixteenth term is 9.
    (a) Use arithmetic means to determine the common difference and the first term of the sequence.

    (b) Calculate t_{19} and determine the general term of the sequence.

14. Which of the following represents an arithmetic sequence with a common difference of -4?
    (a) $8, 4, 3, 1, ...$
    (b) $20, 24, 28, 32, ...$
    (c) $32, -8, 2, -0.5, ...$
    (d) $20, 16, 12, 8, ...$

15. $p-1, p+3, 3p-1$, in that order, form an arithmetic sequence. Which of the following is / are true about p?

    1. p **is even** **2.** p **is odd** **3.** p **is a perfect square**

    (a) 1 only

    (b) 1 and 3 only

    (c) 2 only

    (d) 2 and 3 only

16. Two students are asked to write the first four terms of an arithmetic sequence.

    Rob writes the sequence $-14, -6, 2, 10, ...$ Jason writes the sequence $166, 162, 158, 154, ...$

    Which statement is true about the fifteenth term of these sequences?

    (a) t_{15} is the same in each sequence

    (b) t_{15} is smaller in Rob's sequence

    (c) t_{15} is smaller in Jason's sequence

    (d) there is not enough information to answer the question

17. If $x+2, 3x-4, and 7x-6$ are the first three terms of an arithmetic sequence, then the first term of the sequence has a numerical value of:

    (a) -2

    (b) 0

    (c) 2

    (d) 4

18. Twenty-seven arithmetic means are inserted between the first and last terms of a sequence. The number of terms in the sequence is _____.