Unit 1 Objective 2 Remediation

Using Differences to Identify Patterns

Extending a sequence by using constant differences.

Directions:

- To find the first differences, subtract each term from the next term.

-If the differences are not constant, meaning the same, use those differences and add or subtract to continue the sequence.

Example: Find the next two terms in the sequence below.

2,5,9,14,20,……..

Find the 1st difference

2 5 9 14 20

+3 +4 +5 +6

Since the 1st differences are not constant, find the 2nd

2 5 9 14 20

+3 +4 +5 +6

+1 +1 +1

The 2nd differences are a constant 1. Use the constant 2nd difference to extend the sequence of 1st differences.

2 5 9 14 20 ***27 35***

+3 +4 +5 +6 +7 +8

+1 +1 +1 +1 +1 +1

So the 5th and 6th terms are 27 and 35.

Find the next two terms in each sequence using constant differences. Show your work.

1) 5, 8, 12, 17 ,23,……. _____ 2) 5, 13, 21, 29, 37,……. _____

3) 38, 29, 21, 14,…… _____ 4) 23, 22, 20, 17, 13,….._____

5) 8, 16, 24, 32, 40,…….._____ 6) 100, 97, 94, 91, 88,…_____

7) 30, 31, 35, 42, 52,…._____ 8) 1, 4, 9, 16, 25, …….._____

9) 12, 0 ,-12, -24, -36….._____ 10) -3, -8, -13, -18, -23.._____

11) -1, 1, 7, 17, 31, ……_____ 12) 4, 3, 0, -5, -12 ……..._____

13) The fourth and fifth terms of a sequence are 39 and 54. The second differences are a constant 3. What are the first three terms of the sequence?

14) The first term of a sequence is 8. The first of the first differences is 3. The second differences are a constant 1. What are the first five terms of the sequence?

15) 62,57, 52, 47, 42, …_____ 16) 31, 38, 45, 52, 59, …..._____

17) 18, 29, 42, 57, 74,…_____ 18) 33, 51, 73, 99, 129,….._____

19) 25.5, 24, 21.5, 18, 13.5,._____ 20) 51, 54, 61, 72, 87, …..._____

21) The second differences of a sequence are a constant 2. The first of the first differences is 5 and the first term is 9. Find the first five terms of the sequence.