Unit 1 Day 5 HW: Arithmetic Sequences

Write the recursive formula that goes with the following sequences:

1) 1, 2, 3, 4, 5... $a_n = a_{n-1} + 1$

2) 2, 4, 8, 16, 32... $a_n = 2a_{n-1}$

3) $8, 1, \frac{1}{8}, \frac{1}{64},...$ $a_n = \frac{1}{8}a_{n-1}$

4) 5, 2, -1, -4... $a_n = a_{n-1} - 3$

Find the first four terms of the given recursively defined sequence.

5) $a_n = 2(a_{n-1} - 2)$ and $a_1 = 3$ 2, 0, -4, -12

6) $a_n = \frac{a_{n-1}}{2}$ and $a_1 = -8$ $-4, -2, -1, -\frac{1}{2}$

7) $a_n = 2a_{n-1} + 1$ and $a_1 = 1$ 3, 7, 15, 31

8) $a_n = a_{n-1} - 5$ and $a_1 = 1$ -4, -9, -14, -19

9) $a_n = 3a_{n-1}$ and $a_1 = 1$ 3, 9, 27, 81

10) $a_n = -2(a_{n-1} + 3)$ and $a_1 = 1$ -8, 10, -26, 46

Write an explicit and recursive formula for the following sequences.

11) 19, 13, 7, 1...

Explicit: $a_n = 19 - 6(n-1)$

Recursive: $a_n = a_{n-1} - 6$

12) 9, 17, 25, 33...

Explicit: $a_n = 9 + 8(n-1)$

Recursive: $a_n = a_{n-1} + 8$

13) -3, -1, 1, 3...

Explicit: $a_n = -3 + 2(n-1)$

Recursive: $a_n = a_{n-1} + 2$

14) 110, 88, 66, 44...

Explicit: $a_n = 110 - 22(n-1)$

Recursive: $a_n = a_{n-1} - 22$

Find the finite sum $S_n = \frac{n}{2}(a_1 + a_n)$ of the arithmetic sequence that satisfies the given conditions. Show all work!

15) $a_1 = 1, d = 2, n = 10$ 100

16) $a_1 = 3, d = 2, n = 12$ 168

17) $a_1 = 4, d = 2, n = 20$ 460

18) $a_1 = 100, d = -5, n = 8$ 660

19) $a_1 = 55, d = 12, n = 10$ 1090

20) $a_1 = 8, d = 3, n = 15$ 435