Advanced Algebra

Unit 1: Sequence and Series Assignment #1

Foundational:

1) List the first 5 terms of this sequence in order (U_1 is the first term of the sequence)
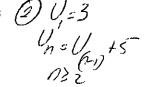
$15, 14, 13, 12, 11$
$U_1 \quad U_2 \quad U_3 \quad U_4 \quad U_5$

$$\begin{cases} U_1 = 15 \\ U_n = U_{(n-1)} - 1 \\ n \geq 2 \end{cases}$$

2) List the first 5 terms of this sequence in order (U_1 is the first term of the sequence)

$16, 23, 30, 37, 44$
U_1

$$\begin{cases} U_0 = 9 \\ U_n = U_{(n-1)} + 7 \\ n \geq 1 \end{cases}$$

Moderate:

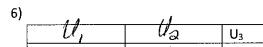**Find the recursive formula for the following Arithmetic Sequences**

② $U_1 = 3$
$U_n = U_{(n-1)} + 5$
$n \geq 2$

③ $U_1 = -8$
$U_n = U_{(n-1)} - 2$
$n \geq 2$

1) $U_3 = 13$ and $U_7 = 25$ $U_1 = 7$ $U_n = U_{(n-1)} + 3$ $n \geq 2$

2) $U_4 = 18$ and $U_6 = 28$

3) $U_5 = -16$ and $U_7 = -20$

4) The 3rd term of an arithmetic sequence is 7 and the 7th term is 12. Using U_1 as the starting value, write the correct recursive formula for this sequence. $U_1 = 4.5$ $U_n = U_{(n-1)} + 1.25$ $n \geq 2$

5)

U_1	U_2	U_3	U_4		U_6
4	12	20	28	36	44

6)

U_1	U_2	U_3	U_4	U_5	U_6
-1	-4	-7	-10	-13	-16

7) $U_3 = 10$ and the common difference is 4 (Your notation should look like below)

$$\begin{cases} U_1 = 2 \\ U_n = U_{(n-1)} + 4 \\ n \geq 2 \end{cases}$$

8) $U_5 = -3$ and the common difference is -8

$U_1 = 29$

$U_n = U_{(n-1)} - 8$

$n \geq 2$

9) $U_4 = -2$ and the common difference is 6

$U_1 = -20$ $n \geq 2$

$U_n = U_{(n-1)} + 6$

10) Theo's bank account started with $600. After 8 weeks, the account has $504 remaining in it. He withdraws (takes out) the same amount each week. Using U_0 as your starting value, write a recursive formula describing the amount of money in his bank account.

$U_0 = 600$
$U_8 = 504$

$\dfrac{600 - 504}{0 - 8} = \dfrac{96}{-8} = -12$

$U_0 = 600$
$U_n = U_{(n-1)} - 12$
$n \geq 1$

Find the recursive formula and find the given term. IT could be arithmetic or Geometric

11) 2,6,10,14,...   Find the 15th term

12) 10,5,0,-5,...   Find the 12th term

13) .4,.04,.004,.0004 Find the 10th term   Arithmetic

Geometric

(11) Arithmetic

$U_1 = 2$

$U_n = U_{(n-1)} + 4$

$n \geq 4$

$U_{15} =$

$U_{15} = 2 + (14)(4)$

$\boxed{U_{15} = 58}$

(12) $U_1 = 10$

$U_n = U_{(n-1)} - 5$

$n \geq 2$

$U_{12} = 10 + 11(-5)$

$\boxed{U_{12} = -45}$

(3) $U_0 = .4$

$U_n = .1 \cdot U_{(n-1)}$

$n \geq 1$

$y = .4(.1)^x$

$U_{10} = .4(.1)^{10}$

$\boxed{.00000000004}$

U_{10}