Name_____

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MATH@TD

MCR3U

11U U7: Quest F23 **K ____/13 T ____/3 C ____/3 A ____/6**

Formulas:

Arithmetic Sequences

Recursive: $t_1 = a, \quad t_n = t_{n-1} + d$

General Term $t_n = a + (n-1)d$

Geometric Sequences

Recursive: $t_1 = a, \; t_n = r \cdot t_{n-1}$

General Term: $t_n = a \cdot r^{n-1}$

Arithmetic Series

General: $S_n = \dfrac{n\left(2a + (n-1)d\right)}{2}$

Know Last Term: $S_n = \dfrac{n\left(t_1 + t_n\right)}{2}$

Geometric Series

General: $S = \dfrac{a\left(r^n - 1\right)}{(r-1)}$

Know Last Term: $S_n = \dfrac{t_{n+1} - t_1}{(r-1)}$

Multiple Choice **K ____/5**

Indicate your choice for each question..

____ 1. What is the 10th term of the sequence: 1, 4, 7, 10, 13, … ?

a. 27 c. 28

b. 31 d. 25

____ 2. Determine the general form for the arithmetic sequence whose 5th term is 10 and consecutive terms decrease by 4.

a. $22 - 4(n-1)$ c. $26 - 4(n-1)$

b. $-2 + 4(n-1)$ d. $-6 + 4(n-1)$

____ 3. What is the general term of the sequence: 6, 42, 294, 2058,14406, …

a. $t_n = 6(7)^n$ c. $t_n = 6(7)^{n-1}$

b. $t_n = 6(6)^{n-1}$ d. $t_n = 7(6)^{n-1}$

____ 4. Determine the next three terms of the sequence 1, 1, 1, 2, 2, 2, 3, 3, 3, 4, 4, ...

a. 4, 5, 5 c. 4, 4, 5

b. 5, 5, 5 d. 4, 5, 6

____ 5. Determine the sum of the geometric series 3 + 15 + 75 + 375 + ... + 46 875.

a. 58 593 c. 19 531

b. 11 718 d. 292 968

Full Solution
Write clear and well written solutions using the following problems. A communications grade out of 3 will be awarded for how well your math is presented.

6. Find the recursive formula and general term of the sequence: 7, -8, -23, -38, ...and find t_{30}. **K ____/3**

7. A mason wants to start building a stone pyramid the base of which has 551 blocks and the top 26th layer has only 1. If the number of blocks on each layer follow an arithmetic sequence, how many blocks should he get in total? **A ____/3**

8. Write the general term of the geometric sequence: 3, –7.5, 18.75, –46.875, ... and find t_8 rounded to two decimal places. **K ____/3**

9. A bacteria culture starts with 1000 bacteria. Each hour, the number of bacteria triples. How many bacteria will there be after 7 hours? **A ____/3**

10. Calculate the sum of the arithmetic series: 11 + 60 + 109 + ... + 697. **T ____/3**

11. Determine S_9 for the geometric series $4 - 16 + 64 - 256 + \ldots$ **K ___/2**