Name_____

A∞Ω
MATH@TD

MCR3U

11U U7: Test W23 **K ____/13 T ____/7 C ____/3 A ____/7**

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. Determine the common difference for the sequence: 13, 17, 21, 25, 29, ...

a. 4
b. 5
c. –3
d. –4

____ 2. If the first term of a sequence is -5 and the common difference is 4, what is the 21st term in the sequence?

a. 85
b. 90
c. 75
d. 70

____ 3. In a weight lifting competition 2.5 kg are added to the lift each round. If the first place winner lifted 75 kg in the 7th round, what was the initial mass of the lift?

a. 62.5 kg
b. 60.0 kg
c. 57.5 kg
d. 55.0 kg

____ 4. What is the common ratio of the sequence: $\frac{3}{2}, 1, \frac{2}{3}, \frac{4}{9}, \frac{8}{27}, \ldots$

a. $\frac{2}{3}$
b. $\frac{3}{2}$
c. $\frac{3}{4}$
d. $\frac{3}{4}$

____ 5. Determine S_{20} for the series: 124, 136, 148, 160, ...

a. 2380
b. 4760
c. 4220
d. 2260

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. The 6th term of an arithmetic sequence is -7, and the 11th term is -17. Determine t_{40}. **T ____/4**

8. A trapezoidal cornfield has 280 plants in the first row and each succeeding row has an additional 125 plants. The last row has 3905 plants.
   a) How many plants are in the 15th row of the field? **A ____/2**
   b) How many plants are there in the field? **A ____/2**

9. 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**

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**

12. A bacteria culture starts with 100 bacteria. Each hour, the number of bacteria doubles. How many bacteria will there be after 6 hours? **A ____/3**