

SAMPLE TEST Unit 1: Sequences and Series

Date: _____

Name: _____

Part A: Multiple Choice. 10 marks

_____ / 25 = _____ %

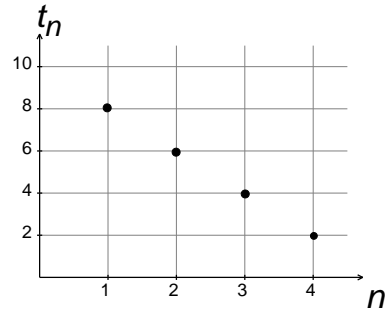
Place the letter corresponding to the correct answer in the blank on the right.

1. What is the general term for the sequence $\{7, 3, -1, -5, -9, \dots\}$? 1. C

- (A) $t_n = -4n + 3$ (B) $t_n = 4n + 3$
 (C) $t_n = -4n + 11$ (D) $t_n = 4n + 11$

2. Which formula generates the sequence represented by the graph shown? 2. A

- (A) $t_n = -2n + 10$
 (B) $t_n = -n + 10$
 (C) $t_n = -n + 8$
 (D) $t_n = -2n + 8$



3. Which equation represents an arithmetic sequence that has a common difference of 4 and $t_{10} = 7$? 3. B

- A) $t_n = -4n + 47, n \in N$
 B) $t_n = 4n - 33, n \in N$
 C) $t_n = 2n - 13, n \in N$
 D) $t_n = n - 3, n \in N$

4. What is S_{10} for the series: $\{4 + 11 + 18 + 25 + \dots\}$? 4. A

- A) 355
 B) 390
 C) 710
 D) 780

5. Which is a diverging sequence? 5. B
- A) $\left\{-4, 4, -2, 2, -1, 1, -\frac{1}{2}, \frac{1}{2}, \dots\right\}$
- B) $\{1, -2, 3, -4, 5, -6, \dots\}$
- C) $\left\{5\frac{1}{2}, 5\frac{1}{4}, 5\frac{1}{8}, 5\frac{1}{16}, \dots\right\}$
- D) $\{0.1, 0.01, 0.001, 0.0001, \dots\}$
6. If a geometric sequence has $t_1 = 2$, $t_4 = 54$, and $t_6 = 2x$, what is the value of x ? 6. C
- A) 81 B) 162
 C) 243 D) 482
7. What are the missing terms for the geometric sequence $\{8, \square, 2, \square, \square, \dots\}$? 7. D
- A) $4, \frac{1}{2}, \frac{1}{4}$ B) $6, -4, -12$
 C) $5, -1, -4$ D) $4, 1, \frac{1}{2}$
8. A yeast population of 5 yeast cells triples every hour. After 1 hour there are 15, after 2 hours there are 45, and so on. How many yeast cells will there be in 5 hours? 8. C
- A) 135 B) 405
 C) 1215 D) 3645
9. Which best describes the sequence, $t_n = 0.7(5)^n$, $n \in \mathbb{N}$? 9. D
- A) arithmetic and converging
 B) arithmetic and diverging
 C) geometric and converging
 D) geometric and diverging
10. What is the sum of the series $\{8 + 7 + \frac{49}{8} + \frac{343}{64} + \dots\}$? 10. D
- A) 27
 B) 26
 C) $\frac{64}{15}$
 D) 64

Part B: Long Answer (30 marks).

**Answer the following questions in the space provided.
Be sure to show all workings to receive full credit.**

1. What is the general formula for the arithmetic sequence where $t_{11} = 25$ and $t_{30} = 101$.

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$$T_n = 4n - 19$$

2. Find the sum of the terms in the arithmetic sequence $-29, -25, -21, \dots, 91$.

___ / 4

961

3. In a geometric sequence, the 3rd term is 72 and the sixth term is 576. ___ / 5

Determine the general formula that describes the sequence and use it to find S_6 .

$$t_n = 18(2)^{n-1}$$

$$S_6 = 1134$$

4. A basketball is thrown into the air and reaches a maximum height of 12 m. Upon hitting the floor it rebounds 60% of the distance fallen. In theory, what is the total vertical distance the ball will travel before it comes to rest?

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60 m

Or $60 - 12 = 48\text{m}$

