

Sequences and Series: Patterns That Add Up

Grade 11 – Algebra 2 math · Test · Standards: A-SSE.B.4, F-BF.A.2, F-IF.A.3

Name: _____ Date: _____ Class: _____

This 45-minute test covers sequence rules, recursive terms, sigma notation, finite arithmetic and geometric series, and savings applications. A calculator is allowed. Show every step.

Standards: A-SSE.B.4, F-BF.A.2, F-IF.A.3 · **Level:** Grade 11 Algebra 2

Time: 45 minutes · 9 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Classify and write a rule (2 points)

- a. Classify 96, 48, 24, 12, ... and give r or d . (1 point)
- b. Write the explicit rule for 8, 13, 18, 23, ... (1 point)

Question 2 Arithmetic sequence analysis (3 points)

An arithmetic sequence has $a_1 = -8$ and $d = 5.5$.

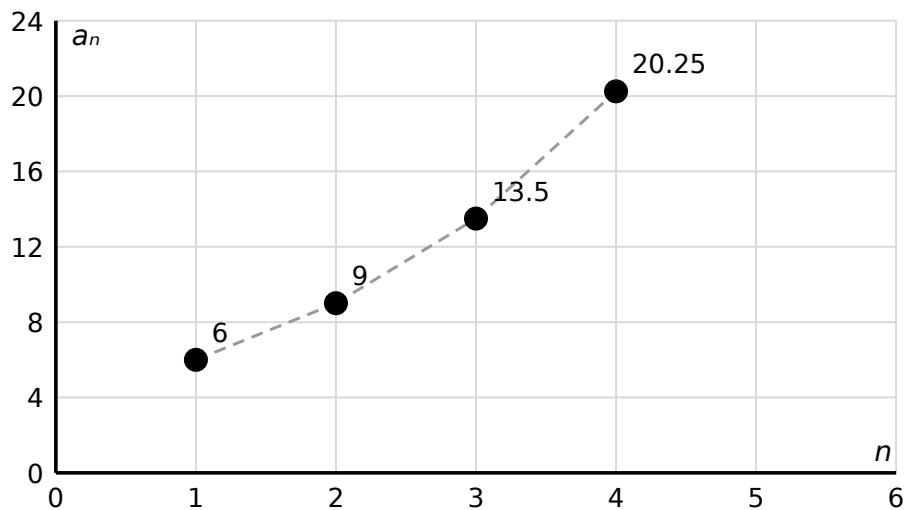
- a. Write the explicit rule. (1 point)
- b. Find a_{40} . (1 point)
- c. Which term equals 47? (1 point)

Question 3 Recursive terms (2 points)

A sequence has $a_1 = 5$ and $a_n = 3a_{n-1} - 4$. List the first four terms.

Question 4 Geometric sequence from a graph (3 points)

The graph shows the first four terms of a geometric sequence.



Graph for Question 4.

- Find the common ratio. (1 point)
- Write the explicit rule. (1 point)
- Find a_6 . (1 point)

Question 5 Arithmetic series (2 points)

Find $15 + 19 + 23 + \dots + 95$.

Question 6 Geometric sigma sum (2 points)

Evaluate $\sum_{k=1}^6 5(0.4)^{k-1}$ to the nearest hundredth.

Question 7 Write and evaluate a sigma sum (2 points)

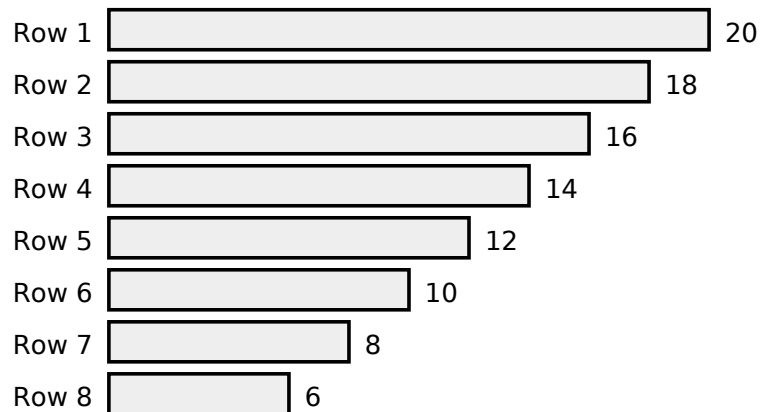
Write $5 + 9 + 13 + \dots + 57$ in sigma notation and find its sum.

Question 8 Savings plan (2 points)

Theo deposits \$150 at the end of each month into an account earning 0.4% per month. Find the balance after 30 deposits.

Question 9 Stacked pipes (2 points)

Pipes are stacked in 8 rows. The bottom row has 20 pipes and each row above has 2 fewer. The bars show the rows.



Graph for Question 9.

How many pipes are there in all?