

Precalculus · Series, Binomial Theorem and an Introduction to Limits · Test

Common Core A-APR.C.5, A-SSE.B.4, F-BF.A.2 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This precalculus sequences series limits test checks series, binomial theorem and an introduction to limits in 45 minutes, with 8 questions for a total of 20 points.

This 45-minute test has 8 questions worth 20 points. It covers sigma notation, arithmetic and geometric series, repeating decimals, the binomial theorem and limits. Show all work, and keep fractions exact unless the question asks for a decimal.

Test information

- **Grade:** Precalculus
- **Chapter:** Series, Binomial Theorem and an Introduction to Limits
- **Common Core:** A-APR.C.5, A-SSE.B.4, F-BF.A.2
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 3 pts; Question 4: 2 pts; Question 5: 3 pts; Question 6: 2 pts; Question 7: 3 pts; Question 8: 3 pts)

Precalculus Sequences Series Limits Test: questions 1-5

Question 1: Sigma notation (2 points)

Consider $\sum_{k=1}^6 (2k-3)$.

- Write out all six terms. (1 point)
- Find the sum. (1 point)

Question 2: Arithmetic series (2 points)

An arithmetic sequence begins 14, 11, 8, ...

- Find a_{20} . (1 point)
- Find the sum of the first 20 terms. (1 point)

Question 3: Geometric series (3 points)

Answer each part.

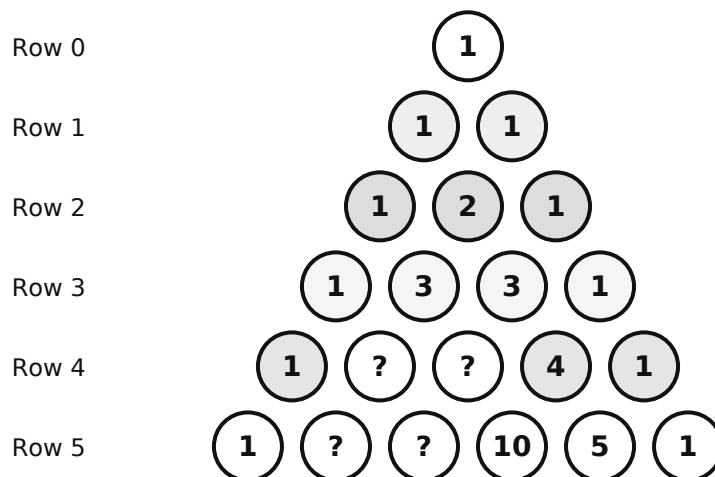
- a. Find the sum of the first 7 terms of $2-6+18- \dots$. (1 point)
- b. Find $20+8+3.2+ \dots$ to infinity. (1 point)
- c. Does $7+8.75+10.9375+ \dots$ have a sum? Explain. (1 point)

Question 4: Repeating decimal (2 points)

Write $0.\overline{45}$ as a fraction in lowest terms.

Question 5: Binomial expansion (3 points)

Rows 0 through 5 of Pascal's triangle are shown with four entries missing.



Each entry is the sum of the two entries above it.

- a. Fill in the four missing entries. (1 point)
- b. Expand $(x-2)^4$. (2 points)

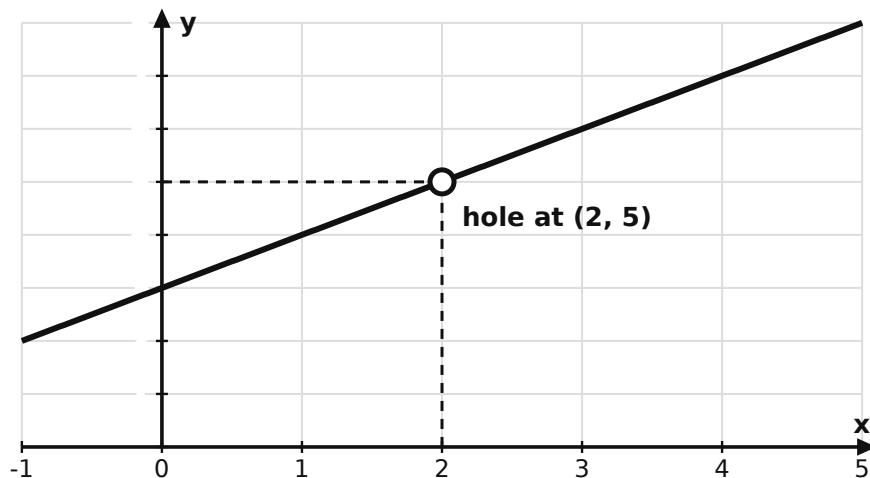
Precalculus Sequences Series Limits Test: questions 6-8

Question 6: Coefficient of a term (2 points)

Find the coefficient of x^4 in the expansion of $(x+2)^9$.

Question 7: Limits (3 points)

The graph shows $h(x) = \frac{x^2+x-6}{x-2}$.

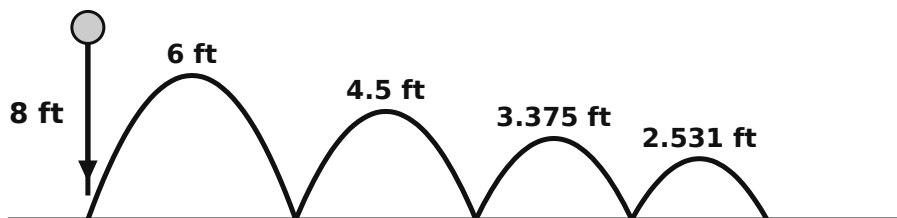


The open circle marks a point the graph skips.

- Find $\lim_{x \rightarrow 2} h(x)$. (1 point)
- Is $h(2)$ defined? Explain. (1 point)
- Find $\lim_{n \rightarrow \infty} \frac{5n-2}{n+1}$. (1 point)

Question 8: Bouncing ball (3 points)

A ball is dropped from 8 feet and rebounds to 75% of its previous height on each bounce. Find the total distance it travels before coming to rest.



Each bounce rises to a fixed fraction of the previous height.

How to use this precalculus sequences series limits test

Take this precalculus sequences series limits test without notes, then grade it with the test answer key out of 20 points.

